Our Polytechnic Identity in the 21st Century

WASC Educational Effectiveness Review Report

California Polytechnic State University, San Luis Obispo

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Introduction

A self-study asks all the university's constituents to step away from their everyday concerns and consider the deep and long-term needs of the institution. Although we at Cal Poly have been fond of describing a self-study as the university doing a dissertation on itself, it can just as well be described as a collective retreat, a time for reflection and preparation for intended action.

In keeping with this reflective aspect, Cal Poly's previous report on the Capacity and Preparatory Review (CPR) was dominated by issues of institutional identity, which proceeded from the self-study's four themes—Our Polytechnic Identity in the Twenty-First Century, Learn by Doing, the Teacher-Scholar Model, and Integration and Student Learning. In keeping with the preparatory aspect, each chapter concluded with a set of recommended action items, many of which have been addressed in the Educational Effectiveness Review (EER).

Consistent with WASC expectations, the EER report does contain a thematic chapter addressing issues of institutional identity, but much more of it is devoted to considerations of student learning, student success, and organizational learning—the three pillars of educational effectiveness. Once again, all four chapters include recommended action items, with parenthetical references leading to supporting text.

Responses to the recommendations of the WASC Commission and Visiting Team are woven throughout the report and gathered together in *Appendix 5.5*. Similarly, the relevant Criteria for Review (CFR) are mentioned at the beginning of each chapter and mapped to the full report in *Appendix 5.6*, but every part strives to address CFR 1.9 on seriousness and candor in the accreditation review process and 4.6 on the leadership's commitment to evidence-based improvement. The appendices include supporting evidence, statistical analyses, and the required data portfolio.

The conclusion presents a holistic, integrating view of what the self-study has allowed and encouraged us to do and proposes high-level next steps to help Cal Poly achieve its twenty-first-century potential. We hope that readers will agree that the picture presented by the report as a whole is one of a comprehensive polytechnic university that, despite the challenges facing all public institutions, is still confident of its mission and energetic in its pursuit of excellence.

Student Learning

It is fitting to begin a report on the Educational Effectiveness Review with a chapter on the assessment and improvement of student learning, which Cal Poly sees as integral to a broad conception of student success. This chapter focuses on two institutional projects that Cal Poly has undertaken since the Academic Senate's approval of the *University Learning Objectives* (ULOs) in 2007. One is a ULO-based pilot focused on five areas of student learning; the other is a campus-wide assessment of the senior project, a capstone experience that has long been a feature of the Cal Poly undergraduate education. The chapter also addresses employer feedback on the overall quality, industry readiness, and skill attainment of Cal Poly graduates.

In general, this chapter addresses aspects of Standard 1, Defining Institutional Purposes and Ensuring Educational Objectives, which include developing educational objectives and measuring student achievement (CFR 1.2) and responding to diversity through educational programs (1.5). The chapter also addresses many aspects of Standard 2, Achieving Educational Objectives Through Core Functions, by exploring how the university states expectations for student learning and demonstrates student achievement of a set of core competencies (2.2, 2.3, 2.4, 2.6, and 2.10).

In its discussion of governance issues, the section on ULO-based assessment addresses aspects of Standards 1, 2, and 3, Developing and Applying Resources and Organizational Structures to Ensure Stability, which relate to the institution's organizational structures and the faculty's exercise of academic leadership and responsibility (1.3, 2.4, 3.8, 3.11). The section also addresses other aspects of Standard 3, which include maintaining appropriate faculty and staff development activities (3.4) and coordinating and supporting IT resources (3.7), and one aspect of Standard 4, Creating an Organization Committed to Learning and Improvement, which is having institutional research capacity to support the assessment of student learning (4.5). Finally, the section on employer surveys also addresses one aspect of Standard 4, which is involving appropriate stakeholders in assessment (4.8).

ULO-Based Assessment in GE and the Majors

Begun in Fall 2008, the ULO-based assessment commonly known as the ULO Project was coordinated by the Director of General Education (GE) under the auspices of Academic Programs. The project marked a concerted effort to define measurable outcomes for the ULOs and to directly assess student attainment of these outcomes. Although the individual assessments are at various stages of completion, the project as a whole has as its major aims to measure "value added," i.e., progress from the freshman year to the senior year, and, where possible, to close the loop by recommending improvements to pedagogy and curriculum.

Background. The project began with the appointment of five faculty members as ULO Consultants, each representing a different ULO-based skill: writing, oral communication, diversity learning, lifelong learning, and ethics. Each consultant formed a broadly representative committee composed of faculty members representing GE and various majors across the university, as well as staff members from Student Affairs. After reviewing nationwide best practices, two committees (Writing and Oral Communication) reviewed class assignments, three (Diversity Learning, Lifelong Learning, and Ethics) developed survey/test instruments to collect essay/multiple-choice responses, and one (Diversity Learning) used focus groups to explore student attitudes; all developed rubrics to identify traits and articulate levels of development. The committees intended to use student work from lower- and upper-division GE as well as major courses to determine freshman/sophomore and junior/senior levels of attainment and thereby measure the value added during a Cal Poly education; only three were able to accomplish this goal (Writing, Diversity Learning, and Lifelong Learning).

While these assessments are best considered as pilots, the committees have made some modest recommendations for educational improvement based on the evidence collected. The university has already implemented some, most notably workshops sponsored by the Center for Teaching and Learning (CTL) on ULO-based assessment of writing and critical thinking in the senior project. In connection with the ULO Project, Academic Programs revised the program review process to include the mapping of major courses and co-curricular activities onto the ULOs. Each program identifies where the ULOs are introduced, developed, and mastered in the major curriculum. A map of the GE curriculum is provided, although programs are not expressly required to consider the GE and major maps together. The intention is to encourage the faculty to locate and address any significant gaps in the students' education.

As an experiment in the assessment of transferable skills across the GE/major divide, faculty members from GE and the Orfalea College of Business ran a pilot of Integrated Program Review in Spring 2009. They applied the University

Expository Writing Rubric to the work of Business students and used the assessment results to discuss how to improve student attainment of the ULO on effective communication. Though the group identified a number of opportunities for strengthening student writing, the integrated model has not been repeated nor revisited.

The ULO Project has come under some scrutiny during recent years. The financial crisis affecting the state, system, and university has necessitated a review of all resource allocations. The provost, concerned about the project's use of faculty release time for the ULO consultants, suspended funding for AY 2011-12. Shared governance has also been an issue; the WASC visiting team in its CPR report encouraged the faculty "to invest time in reviewing the role and critical nature of faculty governance in academic decision-making," while the provost and Academic Senate Chair have shared a particular concern for faculty governance as it applies to academic assessment. This concern applies to the ULO Project; while involving a significant number of faculty and staff members as consultants and committee members, the project was still an initiative of Academic Programs. In AY 2010-11, the Senate responded to this situation and the WASC recommendation by adopting the following:

- AS-716-10 *Resolution on Academic Assessment at the Program and University Levels* established Senate oversight for institutional assessment in addition to clarifying the meaning of assessment and the use of assessment results.
- AS-713-10 *Resolution on the Establishment of an Academic Senate General Education Governance Board* transferred responsibility for GE from the Provost's Office, i.e., Academic Programs, to the Senate. With its location resolved, the GE Committee could return to the issue of GE program assessment, which has been the foundation of the ULO Project.
- AS-735-11 *Resolution on Coordinated Campus Assessment Efforts* approved a task force report that recommended revising the membership of the Academic Assessment Council, in its existing form a committee of managers, to include faculty members from each college. The report also affirmed the council's responsibility for planning and coordinating institutional assessment efforts like the ULO Project.

The university hopes these resolutions will address the governance issues surrounding assessment and, by extension, the ULO Project.

ULO Project 1: Writing

To measure value added, the *ULO Project on Writing* assessed skill attainment at three key educational levels: first-year, 100-level GE composition courses; 200- and 300-level GE writing-intensive courses; and discipline-specific senior courses that emphasize writing.[i] The chair of the ULO Writing Committee was the English Department's Director of Writing, whose specialty is composition assessment and pedagogy. To obtain a consistent framework, the committee developed the four-point *University Expository Writing Rubric* based on five traits of effective writing: purpose, synthesis, support, style, and mechanics. The committee examined persuasive essays of four to six pages in length because curricula across all levels and majors emphasize this type of writing.

Method. The committee collected work from 56 class sections that either had a GE designation of "writing intensive" or were taught by faculty members who made writing a priority. In total, the committee collected 1,147 essays. From this pool, the committee randomly selected 272 essays for scoring: 88 from freshmen, 41 from sophomores, 54 from juniors, and 89 from seniors. 153 of the essays were from men (56%), and 119 were from women (44%), which approximates the university's gender mix. *Figure 1.1* shows the sample's college breakdown.

There were three norming and scoring sessions. Once inter-rater reliability was established, two readers scored each essay, from which all identifying information about student or class level had been removed. Because of time constraints, the two scores were averaged rather than using a third reader to resolve discrepancies. The average scores were used in the following analyses.[ii]

Results: Class Level Comparisons. A statistical analysis compared the variables of Class Level (freshman, sophomore, junior, senior), College, Gender, and Trait. Only Class Level and Trait were significant (see *Appendix 1.1* for full statistical analysis). *Figure 1.2* presents student scores across all traits. A follow-up analysis showed that freshmen scored significantly lower than sophomores, juniors, and seniors; no additional progress in the mean total was evident after students' sophomore year. In other words, seniors differed from freshmen in skill attainment but did not differ from sophomores and juniors. No other significant differences were found for Class Level. The data also show that about 20-25% of sophomores, juniors, and especially seniors did not earn a score of 2 (average attainment) in their writing overall.

Results: Trait Comparisons. Follow-up comparisons showed that students were significantly stronger on both Purpose and Mechanics, which did not differ from each other, than on Synthesis, Support, and Style, which also did not differ from each other. The trait results suggest that these three higher-level writing skills need further development regardless of class level.

The scores in *Figure 1.3* present student attainment as a function of the specific trait assessed. For each trait, the figure shows the percentages of students earning a score of 2 or better on the rubric, as well as the mean score for each trait, all as a function of Class Level. For Purpose, freshmen scored significantly lower than both sophomores and seniors. No other Class Level comparisons were significant. For Synthesis, freshmen scored lower than both juniors and seniors. For Style, only the difference between seniors and freshmen was significant, with freshmen scoring lower. Finally, for both Support and Mechanics, follow-up comparisons showed that freshmen scored significantly lower than sophomores, juniors, and seniors, with no significant differences among these latter groups. It should be noted that most students reached average attainment on at least one trait. Mechanics was especially strong, with 73% of freshmen reaching average attainment or above; this increased to 83% of seniors, 89% of juniors, and 93% of sophomores.

In sum, analyses of the mean scores for each trait yielded the following observations:

- Seniors had higher scores across all rubric traits than freshmen.
- Juniors scored higher than freshmen on Synthesis, Mechanics, and Support.
- Sophomores scored higher than freshmen on Purpose, Mechanics, and Support.
- Sophomores, juniors, and seniors exhibited statistically equivalent levels of attainment across all traits.

Other Writing Assessments

English 134. In AY 2008-2009, the Associate Dean in the College of Liberal Arts and the ULO Writing Consultant conducted an assessment that compared students' initial and final essays in the first-year composition course, English 134 Writing and Rhetoric. The original sample was 156 students from 7 classes. First and last essays from 56 students—8 from each section—were randomly selected for assessment. Essays were scored using an earlier, holistic draft of the expository writing rubric. Final essay scores were significantly higher than those on the initial essays. As a follow-up, scores for both initial and final essays were compared to a constant of 3, indicating average attainment on the holistic rubric. Initial essay scores were significantly lower than 3; in contrast, final essay scores did not differ significantly from the constant. A separate test showed that initial and final essay scores were both correlated with final grades. Initial essay scores were weakly correlated with final grades, whereas final essay scores were significantly correlated with final grades.

The overall pattern of results with regard to the initial and final essay scores yielded promising evidence that students significantly improved in their writing during the quarter, that this improvement moved students to an average and acceptable level of attainment, and that the final essay scores were indicative of final grades. Importantly, the data showed that students progressed from minimal to average attainment of writing skills during the quarter. This finding is consistent with the ULO-based assessment results reported above that show gains following the freshman writing experience and suggest that students retain these initial gains.

Graduation Writing Requirement. All CSU students must satisfy the Graduation Writing Requirement (GWR). Cal Poly students can meet this requirement in two ways:

- Earn a C or better and successfully complete a timed essay in a GWR-designated, 300-level, writing-intensive GE course. Students who are unsuccessful receive feedback and at least one more opportunity to complete the essay. The pass rate was 84% for AY 2010-11.
- Pass the Writing Proficiency Exam (WPE), a 350-500 word, timed, expository essay test scored by writing experts and other faculty members. The WPE pass rate was 70% for AY 2010-11.

The essay and exam results likely constitute non-comparable samples for several reasons: students select the method of administration; the tests are administered in different environments; the content differs from test to test; the scoring differs across test types; and students taking the GWR course receive feedback and have a second opportunity to write the essay. In addition, each test may attract a different population, a factor that may interact with variables such as college, ethnicity, interest in writing, etc. To date, this question has not been looked at in a systematic way because the data have not been readily available. Finally, the essays administered in a GWR course may not be suitable for drawing university-level conclusions because they are only assessed by the instructors of record. However, multiple readers score the WPE using

the *WPE scoring criteria*, which differ from those of the expository writing rubric. WPE readers assign a single score ranging from 1, ineffectual paper, to 6, exemplary paper, based on four traits: comprehension, organization, development, and expression. Stronger connections could be made between the WPE and expository writing rubrics. The expository writing rubric could be revised to function holistically, allowing readers to assign one score to an essay. Conversely, the WPE rubric could be revised to function analytically and thus provide more formative results. The latter approach seems appropriate as the WPE rubric was developed some time ago outside the framework of university-wide assessment.

Employer Surveys. In various surveys, Career Services has asked employers to indicate both the importance they place on certain skills, including written communication, and the degree to which Cal Poly graduates demonstrate attainment of these skills. The data in *Figure 1.4* show a discrepancy between the importance employers place on written communication and their perception of the skill level graduates demonstrate. For example, employers of graduates from the College of Engineering gave written communication a mean importance score of 4.41 on a scale of 1 to 5 with 1 being lowest and 5 being highest. Yet in assessing the industry readiness of engineering students, employers gave students a mean score of only 3.86. This discrepancy is especially important because employers consistently rank communication among the skills they value most in employees. Considering the ULO data showing that senior-level Cal Poly students generally do not outperform sophomores and juniors in writing, it would seem that additional instruction or an increased emphasis on this skill may be warranted.

Recommended Action Items

1. **Ensure that Cal Poly juniors and seniors continue to improve their writing skills (p. 4, 5).**
    - Coordinate efforts with the University Writing and Rhetoric Center to develop and raise awareness of outreach programs that target upper-division students.
    - Identify upper-division students who struggle with writing before their senior year, especially ESL students, and offer additional upper-division writing courses for these students.
    - Coordinate efforts with the CTL and the WINGED (Writing in Generally Every Discipline) program to offer workshops and develop learning communities for faculty members who teach upper-division, writing-intensive courses in GE and the major.
    - Emphasize the value of writing in every discipline by identifying non-GE, upper-division, writing-intensive courses in the majors and across colleges; if such courses are difficult to identify, work with departments to develop discipline-specific, advanced writing courses, possibly tied to the senior project.
    - Actively support Cal Poly's acquisition of an e-portfolio and assessment management system so that students can document and assess their own progress as writers.
2. **Align learning experiences so that GE, the GWR, and the senior project form a coordinated assessment of writing skills at the beginning, developing, and mastery levels (5).**
    - Develop a single expository writing rubric for use by GE or GWR-designated courses, the WPE, and the senior project.
    - Require Cal Poly undergraduates to satisfy the GWR as juniors, i.e., as soon as possible after completing ninety units, so that they can receive additional writing instruction if necessary before attempting the senior project.
    - Make the WPE a formative assessment. The exam should be repurposed so that it becomes a formative tool for improvement rather than a summative gatekeeper to graduation.

ULO Project 2: Oral Communication

The *ULO Project on Oral Communication* began in September 2009. The ULO Oral Communication Committee adopted an operational definition from AAC&U's *Oral Communication VALUE Rubric*: "a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors." Based on this definition, the committee designed a five-point rubric with seven traits: verbal delivery, nonverbal delivery, presence of a central message, organization, language use, use of supporting material, and use of visual aids.

Method. In the first year, the committee sought to establish a benchmark of students' performance toward the beginning

of their academic careers. The assessment entailed videotaping oral presentations delivered by a sample of 102 freshmen enrolled in COMS 101 and 102 during Spring 2010. The sample was 51% female and 49% male and represented all six colleges: Engineering (24%), Agriculture (23%), Science and Math (20%), Liberal Arts (15%), Business (13%) and Architecture (7%). Frequencies for both gender and college distributions did not differ significantly from what would be expected.

Three faculty members from Communication Studies observed and evaluated the speeches. Training sessions ensured norming of scores and provided evaluators the opportunity to discuss, modify, and clarify the rubric as needed. Following these sessions, each evaluator scored a selection of speeches on each rubric trait on a scale of 1 to 5 with 1 being insufficient and 5 being excellent.

Results. *Figure 1.5* shows the overall scores, with the rubric traits presented in order from highest to lowest means. In addition, the figure shows the percentages of students scoring at each level of the rubric. Because so few had scores of 1, percentages for scores of 1 and 2 (insufficient and below average) were added together (see *Appendix 1.1* for full statistical analysis).

Because Use of Visual Aids was not a component of all speeches, two different statistical analyses were run on the differences in mean trait scores. One considered all 7 traits for the 75 students who had scores on all 7, while the second considered all 102 students but excluded Use of Visual Aids. A follow-up comparison showed the same basic pattern in both analyses: students' trait scores were significantly higher for Language Use and Use of Supporting Materials than for Verbal and Non-Verbal Delivery and for Presence of a Central Message than for Verbal Delivery. In the seven-trait analysis, scores were significantly higher for Presence of a Central Message than for Non-Verbal Delivery. There were no other significant differences.

These data suggest that the vast majority of Cal Poly freshmen meet an average (3) or better level of competence in oral communication, even with only introductory instruction. This is good news, but the data also suggest that students' verbal and nonverbal delivery could be developed further; only a quarter of the sample achieved a score of good (4) or excellent (5). Improvement in these areas would likely occur over time as students received further instruction and additional speaking opportunities. However, given that Cal Poly requires most students to take only one course focusing on oral communication, instructors of that course should consider spending additional time on improvement of verbal and nonverbal delivery.

During the second year of the project, the committee presented these results to the University Assessment Council and the Communication Studies faculty. In addition, the committee delivered a ULO-based oral communication workshop through the CTL in which twelve participants applied the rubric after watching both a below average speech and a good speech. The first speech received an average score of 2.2 and the second received an average score of 4.4. This consistency indicates that the participants used the rubric to make reliable distinctions of quality between the two speeches. The committee originally planned a third year of activity to assess senior-level presentations perhaps in connection with senior projects, but budget cuts curtailed this aspect of the project.

Recommended Action Items

3. **Identify areas of the curriculum outside the GE oral communication requirement in which the Communications Studies faculty can partner with other faculties to develop students' oral communication skills (p. 6).**
4. **Complete the ULO Project on Oral Communication by collecting data on upper-division student performance and making a value-added comparison to lower-division results (6).**

ULO Project 3: Diversity Learning

The *ULO Project on Diversity Learning* began in AY 2008-09. Based on faculty and staff feedback, the ULO Diversity Learning Committee designed separate surveys for each of the first three of Cal Poly's *Diversity Learning Objectives* (DLOs) and used a focus-group protocol to assess the last objective. The committee also developed four-point rubrics to score the data collected for each DLO**.**

Method for DLOs 1-3. In fall quarter, the committee collected responses to the DLO questionnaires from 320 freshmen enrolled in ENGL 134, ENGL 145, and ECON 303. In Fall 2009 and Winter 2010, the committee collected 380 responses

from juniors and seniors enrolled in several GE D5 (the upper division elective in Area D/E Society and the Individual) courses as well as ECON 303, IME 482, KINE 411, MATE 481 and ME 430. Students randomly assigned to respond to only one DLO survey completed either paper-and-pencil or online versions. *Figure 1.6* shows the resulting sample as a function of College and Class Level, as determined by students' self-reported expected graduation date. Across the samples, there were 343 men (51%) and 324 women (49%), which approximates the university's gender mix. 400 students (60%) self-identified as white, the largest racial/ethnic group, while 86 (13%) self-identified as multiracial, the next largest group.

In Spring 2010, after ensuring inter-rater reliability, the committee conducted three scoring sessions with faculty and staff members. Although data were collected from all class levels, evaluators did not score the sophomore essays due to resource and time constraints and the assessment emphasis on value added.

For DLO 1, students answered four short essay questions, each corresponding to one of four traits in the rubric: knowledge and understanding, ability to apply a critical perspective, awareness of how personal values and/or ethical/moral frameworks shape individual beliefs, and self-reflection and engagement. Two evaluators scored each set of essays for each trait on a scale of 0 to 4 with 0 being no response and 4 being complex. The two scores were then averaged to obtain one score for each trait, and the four trait scores were then averaged to yield one total mean score for each participant in the assessment. The same process was employed to create mean scores for DLOs 2 and 3.

Results for DLO 1: Diversity, Inequality, and Power. A statistical analysis was conducted on the total mean scores for DLO 1 as a function of Class Level (freshman, junior, senior), College, Survey Mode (in-class, online), and Gender. *Figure 1.7* shows the breakdown of scores by various student categories. The sample sizes were too small to support analyses of the interactions of more than two variables. The results were significant for Survey Mode, Gender, Class Level, and College. Significantly higher scores were evident for the online survey and for males. Follow-up analysis of Class Level yielded evidence of value added: both seniors and juniors scored higher than freshmen but did not differ from one another. With regard to College, the follow-up analysis showed that Agriculture students scored significantly lower than Business, Science and Math, and Engineering students. No other College differences were significant (see *Appendix 1.1* for full statistical analysis).

There was also a significant interaction of Gender by Class Level. The value added was more apparent in men, such that male seniors had significantly higher scores than male freshmen. This was not so with women, whose scores did not differ as a function of Class Level. It should be noted that marginally significant interactions were also present for College by Class Level and College by Survey Mode, but these interactions were not broken down further because of concerns with sample sizes.

Results for DLO 2: Contributions by Diverse Groups. As with DLO 1, a statistical analysis was conducted on the total mean scores for DLO 2 as a function of Class Level, College, and Survey Mode. Gender was not included in the analysis. *Figure 1.8* shows the breakdown of scores by various student categories. The results were significant for Survey Mode, Class Level, and College. Again, the online survey mode resulted in significantly higher scores. The Class Level effect showed that while there were no differences between junior and senior scores, both seniors and juniors scored significantly higher than freshmen. The College effect showed that Science and Math students scored significantly higher than Agriculture and Engineering students, with no other differences among colleges reaching significance. There was, however, a significant interaction between Class Level and College. Among freshmen, Science and Math students scored significantly higher than Business students; among seniors, Science and Math students scored significantly higher than Engineering students. Small, unequal sample sizes mean that caution should be used in interpreting these results.

Results for DLO 3: Perspectives of Diverse Groups. *Figure 1.9* presents the mean scores for DLO 3. The results of the statistical analysis were significant for Class Level, College, and Gender. There were no significant interactions between variables. Men scored significantly higher than women; students in the College of Business scored significantly higher than students in all other colleges except Liberal Arts; Liberal Arts students scored significantly higher than Agriculture students. Finally, there was once more evidence of value added: both seniors and juniors scored higher than freshmen but did not differ from one another. The pilot nature of the project needs to be stressed, especially with regard to college results. The low and uneven numbers of participants make these patterns tentative at best.

Contribution of USCP Program. Starting with the 1994-97 catalog, Cal Poly students have had to satisfy the *United States Cultural Pluralism (USCP) Requirement* by completing a course focusing on diverse groups and social issues. Because

fulfillment of the requirement is the major curricular path for developing diversity-related competence, a separate analysis was conducted to compare mean DLO scores for juniors and seniors grouped together as a function of having taken a USCP course. Although the overall average score for juniors and seniors who had not completed a USCP course (2.02) was lower than the score for juniors and seniors who had completed a USCP course (2.18), this difference was not statistically significant. The percentage of student essays that scored in the 3 (moderate) or 4 (complex) levels was equal to 32% for juniors and seniors who had not completed a USCP course and 38% for juniors and seniors who had completed a USCP course. Although the average score and percentage of essays that met higher standards were both somewhat greater for students who had completed a USCP course, the results do not indicate that having taken a USCP course makes a large positive contribution to diversity learning as defined by the DLOs.

Contribution of Service Learning. Another avenue by which students may gain diversity-related competence is service learning. Although not a graduation requirement, a number of students take service learning courses in fulfillment of GE or major requirements.

The overall average score for juniors and seniors who had not completed a service learning course (2.08) was lower than the score for juniors and seniors who had completed a service learning course (2.19), but this difference was not statistically significant. The percentage of student essays with scores in the 3 or 4 levels was 32% for juniors and seniors who had not completed a service learning course and 40% for juniors and seniors who had completed a service learning course. Similar to USCP, these results do not indicate that service learning makes a large positive contribution to diversity learning as defined by the DLOs.

Method and Results for DLO 4: Professionals in a Diverse World. The committee conducted focus-group sessions with approximately 80 freshmen enrolled in Honors 100 during Fall 2009 and with approximately 90 seniors enrolled in ECON 303 during Winter 2010. These classes were selected because they were available and because students enrolled in these courses likely had the maturity level necessary to explore the issues seriously. Using transcripts of these sessions, the committee compiled a list of key themes discussed by students. The list served as the context for the committee's conclusions about student knowledge, perceptions, and beliefs about working together with people from diverse backgrounds—an appropriate focus for Cal Poly, whose institutional identity is marked by the preponderance of professional degree programs.

The focus-group responses reveal a negative student bias against diversity learning, especially in the context of classroom instruction, which seems to exist before students enter Cal Poly. Senior students were better able than freshmen to reflect on their experiences of diversity learning in the classroom but still gave mixed responses; some were positive about these experiences while others viewed them as a form of indoctrination. Virtually all students who spoke were positive about WOW (the Week of Welcome orientation for freshmen) and other cultural events outside the classroom and wished that there were more such opportunities and more campus diversity in general.

Recommended Action Items

5. **Coordinate diversity learning across the curriculum and co-curriculum to create a scaffold for the development of DLO-based skills (p. 8).**
    - Align the USCP requirement with the DLOs and review USCP courses to see whether they address the DLOs.
    - Align service learning policies with the DLOs and review service learning courses to see whether they address the DLOs.
    - Challenge every major to develop an upper-division experience that addresses the DLOs.

ULO Project 4: Lifelong Learning

The *ULO Project on Lifelong Learning* began in Spring 2010, when Kennedy Library conducted a survey of student information skills in consultation with the ULO Lifelong Learning Committee. Information skills are a foundational component of lifelong learning, and they contribute to other ULOs including written and oral communication.

Method. The survey was designed to identify student competencies by measuring performance on the Information Literacy Learning Objectives, which the library established in 2009. The survey presented students with a research scenario and asked them to respond to a series of 20 questions. Two versions were administered during a one-month period: one for lower-division and one for upper-division students. The versions differed by the order in which questions

were asked and the wording of some questions.

Invitations to participate were emailed to 1,332 lower-division and 2,905 upper-division students. In addition, an open invitation was posted on the library website, and instructors who had previously brought students for library instruction were encouraged to announce the survey to current students. Approximately 98% of the responses came from the email invitations. Without adjusting for the remaining 2%, the lower-division response rate was 28% (367 respondents) and the upper-division response rate was 20% (578 respondents). The high response rate likely resulted from the promise of cash prizes; however, not all respondents answered all questions.

Results. *Figure 1.10* presents the mean scores in terms of percent correct for five questions for which there was a single response. A statistical analysis was conducted to determine whether the correct response to each item was related to Class Level and Instruction; the latter factor distinguished between students who had and had not received library instruction in research methods. In all cases, upper-division students did better than lower-division students. For three of the five items—thesis statement/promising research question, correct identification of citation example, and correct selection of the search term that would yield the fewest results—Class Level had a significant effect, demonstrating value added. There was a marginal effect of Class Level on the correct selection of the search term that would yield the most results. Significant effects of Instruction were found for the thesis statement and correct identification of the citation example. The question on the ethical use of ideas showed no significant effects of either Class Level or Instruction. Across all analyses, no significant interactions between variables were present (see *Appendix 1.1* for full statistical analysis).

The results demonstrate value added across several items on the survey, indicating higher levels of information literacy at the upper-division level. In addition, promising results for the educational effectiveness of library-related instruction were also found, with some indication that lower-division students attending such instruction consistently scored almost as well as upper-division students who had not attended such sessions. It should be noted that the outcomes measured in this scenario-based questionnaire necessarily focused on the means of finding and identifying information rather than on the more complex evaluative and synthetic skills associated with the critical-thinking aspects of information literacy.

Future Plans. The library plans to re-administer the information literacy survey in Spring 2012 to provide more and better data about student learning as a function of Library Instruction and Class Level. When revising the survey, more attention will be paid to the planned analysis, making sure that the upper- and lower-division questions are directly comparable.

ULO Project 5: Ethics

The *ULO Project on Ethics* was developed for a portion of the ULO that reads, “Make reasoned decisions based on an understanding of ethics, a respect for diversity, and an awareness of issues related to sustainability.” The ULO Ethics Committee found *AAC&U’s Ethical Reasoning VALUE Rubric* to be the most appropriate to the project. While adapting the rubric, the committee identified five primary traits relevant to ethics and ethical reasoning: self-awareness, understanding different ethical theories/concepts, ethical issue recognition, application of ethical theories/concepts, and evaluation of different ethical perspectives/concepts.

Method. In the first year of the project, the committee created and piloted a 40-item online test to begin measuring student proficiency in ethical reasoning. Because the instrument was in development, the committee collected limited demographic information: class level, college, and location of administration, i.e., whether or not the test was administered in an ethics course. In addition, several open-ended questions asked respondents to comment on the structure and content of the test in order to collect input for further development.

The instrument included 37 multiple-choice questions. Six questions tested students’ level of self-awareness about the origins of their ethical beliefs. These items were scored on a scale of 1 to 5 with 1 being strongly disagree and 5 being strongly agree. Because these items could not be scored as correct or incorrect, they were not used to compute the score. Eleven questions tested students’ understanding of different ethical theories and concepts; seven tested their ability to recognize ethical issues; six tested their ability to apply ethical theories and concepts; and seven tested their ability to evaluate different ethical perspectives and concepts. These items allowed respondents to choose among four to five answers; responses were coded as correct/incorrect and summed together for a total test score. In addition, the mean score for each of these traits was also computed.

Participants were recruited in two ways. University Assessment Council members, college deans, ethics committee members, and others were asked to identify appropriate courses; the plan was to recruit participants who had been

formally exposed to the study of ethics at the university level. Because the resulting group was too small, committee members and others were asked to administer the test in their own classes, even if these were not related to ethics. Courses finally included BMED 420, BUS 424, ES 244, ES 322, PHIL 230, PHIL 231, PHYS 405, and PHYS 424. The pilot resulted in completed responses from 264 undergraduate students—more than expected—representing every college and class year (first year, second year, third year, fourth year) as well as varying levels of ethics coursework.

Results: Class Year and College Comparisons. *Figure 1.11* shows the numerical breakdown by College and Class Year. Out of 31 points possible, the average exam score was 12.45; i.e., students answered 40% of the questions correctly (see *Appendix 1.1* for full statistical analysis). Because of small and uneven sample sizes and concerns regarding the distributions of the data, separate statistical analyses were run to compare the total scores as a function of Class Year (see *Figure 1.12)* and College (see *Figure 1.13*). The result for Class Year was not significant; there was no evidence of value added on the ethics scores, though this may have been a function of small sample sizes. The visual pattern of the data when comparing first-year students to fourth- and fifth-year students is in the predicted direction, i.e., first-year students have lower scores than fourth- and fifth-year students. In contrast, the result for College was significant. Separate follow-up analyses showed that students in the College of Science and Math scored significantly higher than students in all other colleges. No other differences among colleges were significant.

Results: Trait Comparison. *Figure 1.14* shows the mean trait results as a function of Course Enrollment, i.e., whether or not students had taken or were currently enrolled in a university-level ethics course. Because the different traits were tested with different numbers of items, the means shown for each trait are the mean percentages of correct answers. It should be noted that all responses are at a higher level of ethical reasoning than would be expected by chance.
A mixed-model analysis compared the four different traits as a function of Course Enrollment. There were no effects involving having taken an ethics course. Among the traits, students scored significantly higher on Application of Ethical Theories/Concepts as compared with both Understanding Different Ethical Theories/Concepts and Ethical Issue Recognition. Students also scored significantly higher on Evaluation of Different Ethical Perspectives/Concepts as compared with Understanding Different Ethical Theories/Concepts. Finally, students scored slightly higher on Ethical Issue Recognition as compared with Understanding Different Ethical Theories/Concepts. No other comparisons were significant.

The sample sizes were too small to allow an analysis by both College and Class Year. Being able to do so would have helped reveal whether the finding that students in Science and Math scored higher than students in other colleges can be better understood as a function of Class Level (freshman, sophomore, junior, senior). Recruiting Science and Math students from upper-division physics classes may have created selection problems that impact the generalizability of the results. Still, a positive result is that students are better at applying and evaluating different ethical perspectives and concepts, even if they are not as good at recognizing and understanding these concepts. It may be possible to use students' application and evaluation capabilities to help them better identify and understand ethical issues, especially when these issues are presented in more abstract terms as items on a test.

Due to budget cuts, the ethics project was only active for one of the three years originally proposed. Plans for the second year had included refining the test and assessing the achievement of a larger, more varied set of students. If the project is revived, it may be important to re-examine how ethics is defined for assessment purposes or to better align the instrument with the learning outcomes of ethics courses because having taken such courses did not improve students' performance on the assessment.

Recommended Action Items

6. **Complete the ULO Project on Ethics, taking into account the need to align the instrument with the learning outcomes of ethics courses (p. 10).**

Final Comments on the ULO Project

The ULO Project represents Cal Poly's first foray into institutional assessment, and the individual projects need to be viewed as pilots that should inspire further thinking about processes, measures, and resources. The ULO Project has required and institutional investment of time, effort, and support, but it has also involved a large number of participants from across the university, many of whom volunteered their time and expertise. The effort yielded important cross-unit conversations and collaborations on assessment that have not been part of Cal Poly's culture. This in itself is worth an investment.

Recommended Action Items

7. **Place institutional assessment within a comprehensive plan describing assessment at all levels.**
8. **Ensure that institutional assessment of the ULOs uses a consistent approach that yields comparable results: rubrics contain the same number of points; expected levels of performance are clear and reasonable; sample sizes are adequate; the method of statistical analysis is standardized across traits, colleges, and class levels; recommendations are targeted for implementation and assessment.**
9. **Expand Cal Poly's capacity for institutional research.**
    - Increase staff in Institutional Planning and Analysis to give that office the ability to conduct statistical analyses of assessments at all levels.
    - Provide faculty and staff with professional development opportunities on how to design assessments as well as understand and use the results.
10. **Use the results of the ULO Project to inform future efforts at institutional assessment, keeping in mind the proposed WASC requirements for the assessment and benchmarking of core competencies; in this regard, address the apparent omission of quantitative skills from the ULOs.**

What Employers Tell Us

Employers are obviously an important stakeholder group for Cal Poly because they contribute to the ultimate success of our students. Career Services has used employer surveys to obtain direct feedback on the overall quality of graduates, their readiness for industry, and their skill attainment in various areas, including those represented by the ULOs. The surveys are administered by mail or to employers participating in career fairs and on-campus recruiting.

Career Services worked with the Colleges of Architecture, Business, and Engineering to conduct college-wide employer assessments in 2007 and 2009 and is in the process of completing 2011 assessments that will include a longitudinal analysis over the last six years. Career Services has also worked with departments in the Colleges of Agriculture and Liberal Arts.

Career Services and the academic units collaborate on the development of the survey instruments. Each instrument is designed to meet the specific needs of the unit, including its accreditation standards (see *Appendix 1.2* for examples). Because the various units and accrediting agencies use different terminology, Career Services has developed a matrix that aligns each unit's standards with the ULOs (see *Appendix 1.3*). For more information, refer to *Career Services*.

Findings. In a number of different surveys, employers were asked to evaluate the overall quality and industry readiness of Cal Poly graduates on a scale of 1 to 5 with 1 being lowest and 5 being highest. Across all colleges and departments for which employers were surveyed, Cal Poly graduates scored between 4 and 5 in both areas. *Figure 1.15* shows the survey results as a function of college/department and survey year.

Using the same five-point scale, employers were also asked to assess graduates' skill levels and to rate each skill's importance. *Figure 1.16* provides an example of an employer assessment for an individual department, Mechanical Engineering, in 2009. As the example shows, Mechanical Engineering graduates scored higher in problem solving, teams, ethical behavior, and knowledge. They scored lower in global/societal context and contemporary issues. Employers valued problem-solving, ethical behavior, and oral communication skills the most in graduates.

As would be expected, the skill level employers attribute to Cal Poly graduates varies among colleges and departments. In general, employers say that they are satisfied with the overall quality of Cal Poly graduates, that graduates are industry-ready, and that graduates are able to make a positive contribution in the workplace.

The Assessment of the Senior Project

The senior project has been a distinctive component of the student experience at Cal Poly since the university first required a 5000-word "senior thesis" in AY 1941-42, the same year it began to confer the BS degree. According to the 2001 *Senior Project Policy*, "the senior project is a capstone experience required for all Cal Poly students receiving a baccalaureate degree," but the policy does not define the nature of the capstone beyond saying that it "integrates theory

and application from across the student's undergraduate educational experience" and making a weak recommendation on the inclusion of writing; the Academic Senate has not updated the policy since approving the ULOs in 2007. As a capstone experience, the senior project should be a high-impact practice as defined by Kuh and promoted by both the CSU and AAC&U, but until now the university had done little to evaluate its educational effectiveness at either the program- or institution-level.

The campus-wide senior project assessment known as SP2 was intended to promote an institutional conversation on the project both as a capstone experience defined in relationship to the ULOs and as a reliable artifact of student learning that could facilitate the assessment of mastery-level skills in the major. The hope was that SP2 could leverage Cal Poly's longstanding commitment to the senior project; it could form one of the pillars of institutional assessment and, when combined with the assessment of beginning-level skills in GE, demonstrate the value added by a Cal Poly undergraduate education, at least at the program level.

SP2 also addressed four action items contained in Cal Poly's recent CPR report, all of which relate more or less directly to the senior project:

- Use program review to assess [student] learning at the university level and to ask university-level questions about the senior project, Learn by Doing, etc.
- Ensure that, in all programs, the senior project or thesis is truly a Learn by Doing experience that integrates the broad sweep of advanced learning.
- Revise the senior project policy to ensure that the project is truly integrative and can be used to assess the broad sweep of senior-level learning.
- Make the educational effectiveness of the senior project a focus of Educational Effectiveness Review (EER).

A post-CPR discussion of these recommendations with the Vice Provost for Programs and Planning quickly led to an institutional commitment to make the assessment of the senior project a focus of both EER and the 2010-12 cycle of program review. The college associate deans, who manage assessment and program review in their units, became natural leaders in this process. They collaborated with the CTL Director on the development of the *guidelines* and on the design and delivery of three workshops to support program review—two on the assessment of writing and critical thinking skills and a third on the use of student success and engagement data. With a clearly defined and highly motivated audience, the workshops were well attended and a similar series is being offered in AY 2011-12.

As described in the FAQ and guidelines, SP2 had both an indirect component involving all academic programs and a direct component involving only those programs undergoing review in 2010-12. [iii] The indirect component began in Spring 2010 with a short survey administered to all undergraduate programs and designed to establish a basic understanding of the senior project as it is currently practiced—its prevalence, form, outcomes, and conformance to policy. A detailed discussion of the results appears later in this chapter, but here it is worth noting that, according to the survey:

- All the responding programs do, in effect, expect their students to complete a senior project.[iv]
- Almost all the programs require some or all of their students to demonstrate mastery-level attainment of writing and critical-thinking skills in their senior projects.

The indirect component of SP2 continued in Fall 2010 with all programs conducting a self-assessment of their senior projects using the *WASC Rubric for Assessing the Use of Capstone Experiences for Assessing Program Outcomes*. In Spring 2012, the university administered a student survey on the experience of the senior project. A discussion of the results for both appears later in this chapter.

The direct component of SP2 built on the findings of the program survey by asking those programs undergoing review to assess their senior projects for mastery-level writing and critical thinking skills using Cal Poly's *University Writing Rubric* and AAC&U's *Critical Thinking VALUE Rubric*. The guidelines recommended a method of blind reading based on the grading of the *Writing Proficiency Exam*, in which many faculty members from across campus participate. The guidelines suggested that programs use the writing rubric "as is" because it has undergone considerable development as an interdisciplinary tool for ULO-based assessment. Because this campus-wide effort had not yet expanded to include

critical thinking, the guidelines gave programs more latitude in their use of the VALUE rubric, which was relatively new to the campus. Working with their associate deans, programs had the option to rewrite the rubric to reflect a discipline-specific understanding of critical thinking as long as the result maintained the same criteria and four-point structure.

This suggested treatment of the two rubrics grew out of an ambition to aggregate the results of both assessments. Under financial pressure, the university wanted to see whether local efforts could support valid institutional conclusions as expected by WASC. Toward this end, the Director of Institutional Planning and Analysis devised a simple spreadsheet that would allow programs to report individual student scores and ID numbers in a consistent manner so that he could check the reliability and representativeness of the results. There was some pushback to this proposal, and six programs ultimately submitted their student scores without identification.

EER Program Survey

As mentioned above, the preliminary phase of SP2 was a brief survey with a maximum of 15 questions, which was sent to all departments in Spring 2010. The survey's design reflected the CPR surveys in breaking down the seven ULOs, many of which are compounds ("think critically and creatively") or general statements ("communicate effectively") that cannot be effectively assessed, into 13 component skills. The design also took into account a semantic problem: the leaders of the self-study couldn't be sure whether or not respondents would understand senior project to be a capstone experience; some programs distinguish between the two. Therefore, the survey instrument used some variant of "senior project or capstone/culminating experience" (see *Appendix 1.4* for instrument and analysis).

Academic Programs sent the survey to all department heads/chairs. The response rate was 98%, with 63 of 64 undergraduate programs participating. Because the validity of results depends somewhat on the person taking the survey, it is worth noting that 89% were department heads or chairs, and 91% answered the survey without consulting anyone else in the department or program.

Do All Students in Your Program Have to Undertake a Senior Project? This was the most fundamental question given how little the university knew about the project when this investigation began. Fortunately, all but one program respondent answered yes. The one that answered no made a false distinction between students taking a capstone course and students pursuing a traditional, independent, research-oriented project; both are prevalent alternatives as indicated by the responses to the next question.

How Many Students Are Involved in the Various Types of Senior Project? This was a very basic question given the vagueness of the Senior Project Policy; program respondents could have selected multiple responses. The results indicate that the most prevalent type of senior project is the cost-effective capstone course, with 42% of respondents saying that all or most of their students are involved in this type (see *Figure 1.17*). The student-defined research project, the traditional and more costly option, came in a close second, with 39% of respondents saying that all or most of their students are involved. Forming a top tier with the capstone course and research project were the public presentation (34% saying all or most), the design project (31%), and the self-guided study (29%). By comparison, student involvement in an experiment or a faculty research project appears to be much less prevalent, with 15% of respondents saying that all or most of their students conduct an experiment and 10% saying that all or most contribute to a faculty research project. All other alternatives came in at less than 9%.

How Many Students Are Expected to Demonstrate Mastery Level Attainment of the ULOs in the Senior Project? Any attempt to improve the Senior Project Policy should address some fundamental, ULO-related questions. To be a meaningful capstone experience, should a senior project address all the objectives or just a significant portion of them? Are there some ULOs that, because of their importance and pervasiveness, all senior projects should address? The answers should reflect an understanding of current practice as suggested by the results of the program survey.

Not surprisingly, given its importance in higher education, the ability to "think critically" was the most highly ranked in the program survey, with 98% of program respondents saying that all or most of their students are expected to demonstrate this skill in their senior projects at a highly-developed or mastery level (see *Figure 1.18*). Surprisingly, given the policy's weakness on this subject, the second most highly ranked skill was the ability to "communicate effectively: written," with 95% of programs expecting a mastery-level performance from all or most of their students. Figure 1.18 shows that writing and critical thinking were among a top tier of six skills rated above 80%. These included the ability to "engage in lifelong learning" as it concerns "independent research" (85%), probably reflecting the tradition of autonomous, discovery-oriented work in the senior project.

As described above, most of the ULOs bring together skills that seem to be better related in theory than in practice; the results of the program survey suggest that they are not addressed equally in the senior project. "Think critically" ranked higher than "think creatively" (98% of respondents answering all or most vs. 80%); written communication ranked higher than oral (95% vs. 59%); "demonstrate expertise in a scholarly discipline" ranked higher than "understand that discipline in relation to the arts, sciences, and technology" (92% vs. 57%); and "work productively as individuals" ranked higher than "work productively in groups" (92% vs. 54%).

The ULOs have their share of social goals, among which students' ability to "use their knowledge and skills to make a positive contribution to society" ranked at the top of the lower tier of skills. According to the survey, 66% of respondents expect mastery-level performance in this area from all or most of their students. The ability to "make reasoned decisions based on an understanding of ethics, a respect for diversity, and an awareness of issues related to sustainability" is another compound of skills that relates critical thinking to three sets of not equally shared values: ethics (59% responding all or most), diversity (46%), and sustainability (33%). The relatively high ranking of ethics in the senior project probably reflects its position in professional formation; in general, the lower tier of ULO-based skills suggests the lesser importance of social purpose, oral communication, collaboration, and shared values in the senior project as it is currently practiced.

Does Your Program Have a Written Policy on the Senior Project? Does the Policy Describe Expected Learning Outcomes? The last question set of the program survey was intended to measure conformance to the *Completion of Senior Project Policy*. Among other things, this policy requires that department heads/chairs provide students with senior project guidelines in electronic or printed form. The results are encouraging, with 78% of program respondents indicating that they have a written policy on the senior project and 72% of these respondents saying that their policies describe expected learning outcomes. The 22% of respondents indicating that they do not have a written policy suggests an area for improvement.

Capstone Assessment

In order to determine whether the senior project as currently practiced could support the mastery-level assessment of student learning, SP2 began with all undergraduate programs assessing their projects using the four-point WASC capstone rubric (1 = initial, 2 = emerging, 3 = developed, and 4 = highly developed). Fifty-two of sixty-four programs completed the assessment, a response rate of 81%. Institutional Planning and Analysis disaggregated the results by college, converted them into bar graphs, and made them available to the associate deans, who used them to prepare their college-level summaries. The institutional results (see *Figure 1.19*) were as follows:

- **Relevant Outcomes and Lines of Evidence Identified.** This was the highest ranked criterion at the university level, with a mean of 2.6 indicating a condition between emerging and developed. According to the rubric, the faculty has identified outcomes but has not necessarily made plans to collect evidence.

- **The Student Experience.** This was the second highest ranked criterion, with a university mean of 2.5 indicating a condition between emerging and developed. Students know the purpose and outcomes of the capstone and are on their way to embracing it as a learning opportunity, but they do not help to refine the experience. Information is becoming readily available in program documents.

- **Valid Results.** This was the third highest ranked criterion, with a university mean of 2.2 indicating a more-than-emerging condition. The faculty has made plans to collect evidence but has not necessarily developed criteria for assessing each outcome.

- **Results Are Used.** This was the fourth highest ranked criterion, with a university mean of 2.1 indicating an emerging condition. The faculty has collected results for each outcome but has not used results to improve the program.

- **Reliable Results.** This was the lowest ranked criterion, with a university mean of 1.9 indicating a less than emerging condition. Faculty members reviewing student work may not be calibrated; there may not be checks for inter-rater reliability.

These are, of course, generalizations at the university level, based on self-reports, but calibration and reliability did prove to be issues later in the direct component of SP2.

College results varied, with the Engineering programs giving themselves the highest rating on every criterion but one, and

the Science and Math programs always giving themselves the lowest. These differences may reflect discipline-specific readings of the rubric or the contrasting experiences of a college in which almost all the programs are externally accredited by a single agency and a college in which, outside of the School of Education, none of the programs are externally accredited. Still, the overall results, which range from less than developed to less than emerging, indicate that there is work to be done if Cal Poly wants to rely on the senior project as an artifact of program-level assessment.

EER Student Survey

A successor to the CPR surveys of students, staff, and faculty, the EER Student Survey explored student perceptions of the senior project. A prerequisite was the identification of the appropriate population of seniors, which was surprisingly difficult as it could not be accurately defined by either class level or course completed. As a result, invitations were sent to all of the more than 7000 students identified as seniors in the registration system; 4234 responded and 1070 took the entire survey after identifying themselves as having completed or nearly completed their senior projects. As an incentive, all respondents were entered in a raffle for two $100 Visa gift cards.

The original intention was to capture an entire cohort of graduating seniors by administering the survey during Winter, Spring, and Summer 2011, but the first two rounds generated a sufficient sample and the survey was not administered in summer. Because it was difficult to identify the population, it is correspondingly difficult to calculate a precise response rate, but a comparison of the 1070 respondents who took the entire survey to the 2,969 actual recipients of bachelor's degrees in Winter and Spring 2011 suggests a response from one third of the eligible population. The survey oversampled women, as is common, and students from the College of Engineering and the College of Science and Math, but the results were otherwise representative (see *Appendix 1.5* for instrument, representativeness study, and analysis of results).

The student survey included a question about the form of the senior project, similar to that on the program survey; two questions about writing; three National Survey of Student Engagement (NSSE)-based questions about the senior project as a high-impact educational practice; a question about the project's contribution to student achievement of the ULOs, based on the NSSE and CPR surveys; a related question about integrative learning, based on the CPR surveys; a series of questions about policy, performance, and timely completion of the project; and a series about the archiving of projects in Kennedy Library. A final summative question asked about students' overall satisfaction with the senior project experience. The survey also provided opportunities for students to make comments, which have been only partially analyzed. The instrument was pretested with two student focus groups and revised before administration. What follows is a visual reading of the data that should suggest avenues for deeper analysis and interpretation.

Senior Project Form. The survey asked students to indicate the form of their senior projects; students could select multiple responses. The results suggest that the three most prevalent forms are the student research project (40% of respondents), capstone/senior project course (36%), and design project (33%). Forming a second tier in terms of prevalence were the public presentation (15%), experiment (14%), and self-guided study (12%); all other options formed a third tier (less than 8%) with the exception of "other" (15%). These results roughly correspond to those of the program survey, which found the capstone course to be the most prevalent, followed by the student-defined research project, public presentation, design project, and self-guided study in that order. It is notable that the public presentation, which ranked surprisingly high in the program survey, ranked in the middle in the student survey.

The survey also asked students to indicate whether their senior projects consisted primarily of a written document and, if not, whether their projects required a written component. Given the weakness of the Senior Project Policy on the matter of writing, the results were among the most conspicuous in the survey: 94% of respondents said that their projects consisted primarily of a written document or required a written component. This large percentage supports the idea that there should be a demonstration of mastery-level writing in every senior project.

High-Impact Educational Practices. As a capstone experience, the senior project should be among those high-impact educational practices that George Kuh has identified as having positive effects for all participating students but especially for under-represented minorities.[v] Kuh has examined these practices in relation to four sets of "educationally purposeful activities" measured by the NSSE. In assessing the educational effectiveness of the senior project, then, it seems reasonable to ask how the project promotes such activities. The student survey asked a pair of questions based on the twelve components of the NSSE Deep/Integrative Learning Scale, the use of which seemed appropriate to the senior project.[vi]

The first question explored the dimension of frequency by asking students how often they did eight educationally

purposeful activities in their senior projects; more than 60% of respondents said "very often" or "quite a bit" for all eight. The highest ranked activity by a wide margin was "integrate ideas and information from various sources" (90% saying "very often" or "quite a bit"). This should be an important component of any capstone experience along with "put together ideas or concepts from different courses" (77%), which ranked second highest. The lowest ranked activity was "try to better understand someone else's views by imagining how an issue looks from his or her perspective" (63%), which trailed "include diverse perspectives" (68%). These results suggest that the senior project may be presenting around two thirds of Cal Poly students with opportunities to address the third DLO, "Consider perspectives of diverse groups when making decisions."

The second question explored the dimension of quantity by asking students how much their senior projects emphasized four activities corresponding to the higher levels of Bloom's taxonomy of cognitive skills; more than 75% answered "very much" or "quite a bit" for all four. The lowest ranked activity was "applying theories or concepts" (78% saying "very much" or "quite a bit"), which should be another important component of any capstone experience. The higher ranked activities were "making judgments about the value of information" (83%), "analyzing the basic elements of an idea" (84%), and "synthesizing and organizing ideas" (85%)—all indications that the senior project is providing a large majority of students with opportunities to reach the highest skill levels.

The third question also explored the dimension of quantity, this time by asking students how much their senior projects provided them with opportunities to do five activities that are supposed to make high-impact practices effective.[vii] As such, the five activities suggest a scale that could be used to measure the degree to which the senior project is high impact; more than 50% of respondents said "very often" or "quite a bit" for all five. By a wide margin, the highest ranked answer was "devote considerable time and activity to purposeful tasks" (87%), a measure of students' investment in the project. The lowest ranked was "experience diversity through contact with people different from yourself" (53%), which still suggests that the senior project is providing a majority of Cal Poly students with opportunities to address the second DLO, "Function as members of society and as professionals with people who have ideas, beliefs, attitudes, and behaviors that are different from their own."

Contribution to ULO Achievement. Any attempt to strengthen the definition of the capstone experience in the Senior Project Policy will need to address the ULOs, which define educational expectations for all Cal Poly students. Accordingly, the survey asked how the existing experience contributes to student achievement of these objectives using the same ULO-based skills as the EER Program Survey.

The results suggest that the experience is making the greatest contribution to "working productively as an individual"; 92% of respondents said that their senior projects contributed "very much" or "quite a bit" to their achievement in this area, a result that is not surprising given the project's tradition of autonomy. The second- and third-highest-ranking skills were "thinking critically" and "communicating effectively: written"; 89% of respondents said that their senior project contributed "very much" or "quite a bit" to their achievement in the first area and 85% said the same about the second. These skills were closely followed by "thinking creatively" and "demonstrating expertise in a scholarly discipline" (both 82%).

Forming a second tier of skills were "engaging in lifelong learning" (78%), "understanding that discipline in relation to the larger world of the arts, science, and technology" (73%), "using your knowledge and skills to make a positive contribution to society" (69%), and "communicating effectively: oral" (68%). Forming a third tier were "making reasoned decisions based on an understanding of ethics" (58%), "working productively in groups" (55%), "making reasoned decisions based on an awareness of issues related to sustainability" (49%), and "making reasoned decisions based on a respect for diversity" (48%).

These answers are comparable to those for the ULO-based question in the program survey. In each case, skills that are conjoined in the ULOs were not ranked equally. In the student survey results, critical thinking ranked somewhat higher than creative thinking, written communication ranked substantially higher than oral communication, disciplinary expertise ranked higher than contextual understanding, and individual work ranked significantly higher than group work. Also in each case, the ability to make a positive contribution to society ranked above the ability to make reasoned decisions on the basis of shared values, whether related to ethics, diversity, or sustainability.

These results strongly point to potential areas of improvement. The capstone should be not only an end to students' undergraduate experiences but also a bridge to their later lives. If that is the case, then the university should give serious

consideration to the skills emphasized in the senior project, especially when they do not match the skills employers value, such as collaboration and the ability to work with diverse groups of people.

Integrative Learning. This question looked at the extent to which the capstone draws on student experiences in a set of learning venues originally established for the CPR surveys. The most conspicuous result reinforces what we have already learned about the perceived relationship between disciplinary expertise and contextual understanding. 88% of respondents said that their senior projects drew "very much" and "quite a bit" on "major courses in the major curriculum," but only 18% said the same about courses in the GE curriculum; 53% said their senior projects drew "very little" on GE courses. These results suggest that, from students' point of view, skills transferred from GE to the major do not contribute to the capstone. There are two interpretations of these data: either the transfer is taking place and students don't see it, which is a problem in itself, or the transfer is not taking place to the degree that would make it noticeable to students. In either case, the issue is skill transfer from GE to the major, not the inherent effectiveness of GE, which is best demonstrated by direct assessment as attempted in the various ULO projects.

Policy, Performance, and Timely Completion. The first question in this set tested agreement with statements based on elements of the Completion of Senior Project Policy, which was designed to address concerns about the project being an impediment to timely graduation. The results for this question were generally positive, with more than 70% of respondents agreeing or strongly agreeing with four of the five statements. In particular, 80% agreed or strongly agreed that "my department/major provided senior project guidelines to students in electronic or written form," a result that corroborates a similar finding in the EER Program Survey. In contrast, only 54% agreed or strongly agreed that "my department/major held regular orientation meetings, and all senior project students were expected to attend." The relatively small majority suggests a possible area for improvement in the way students are supported at the department/program level, keeping in mind that certain forms of senior project, e.g., the capstone course, may not require regular orientation meetings.

The second question tested agreement with statements relating to other issues that might affect performance on the senior project. Once again, the results were generally positive, with 80% or more of respondents agreeing or strongly agreeing that they were academically prepared, that performance expectations were made clear to them, that they received the necessary guidance, and that they had adequate time to complete their projects.

Three questions went on to address the longstanding belief that the senior project is an impediment to graduation. While the project might have been a significant obstacle in the past, the survey results suggest this is not the case for current Cal Poly students. The first question addressed the issue most directly by asking students whether they had completed their projects while enrolled in their senior project courses; 92% of respondents said yes. The second and third questions addressed the issue indirectly by asking students, first, how many course credit units they had received for completing their senior projects and, second, how many course credit units they *should* have received; the difference, if any, was intended to reveal whether students think they are overworked or underworked.

According to the Senior Project Policy, "The total number of senior project units must be at least 1 unit and no more than 6 units"; the survey results suggest that this is the case. 90% of respondents said they had received 1-6 units of course credit for completing their senior projects, with the largest number (38%) receiving 4 units. The results also suggest that some students may, in fact, be overworked. 43% of respondents indicated they had received the appropriate number of units, while 46% thought they should have received 1-4 more units for completing their senior projects. At the very least, these results suggest a disjunction between faculty expectations and some students' perceptions of the senior project—a possible area of improvement that may impact student success.

Archiving. At the request of Kennedy Library, the survey contained three questions that addressed the archiving of senior projects. Current policy allows each department to decide its own approach, and the library is concerned that the policy does not lead to a consistent sample of projects made available to the campus or the public. This problem may not be serious as only 30% of respondents, in working on their own senior projects, looked at past projects made available by the library. However, 83% of these respondents agreed or strongly agreed that it was useful to look at past projects. Finally, the results suggest that, on their own, students will not archive their projects, with only 42% of respondents planning to provide the library with a digital version.

Satisfaction. After the granular approach of the previous questions, the survey ended in a summative fashion by asking students to rate their "entire educational experience of the senior project." The result indicates a very high level of

satisfaction, with 85% of respondents rating their experience as good or excellent. Although there are clearly possibilities for improvement, it seems that, from the student point of view, the senior project at Cal Poly is functioning at a high level.

Assessment of Writing and Critical Thinking Skills
As described above, the direct component of SP2 asked academic programs undergoing review to assess their senior projects for mastery-level writing and critical thinking skills. The schedule of reviews determined that these programs were concentrated in the Colleges of Agriculture, Liberal Arts, and Science and Math, with one in the College of Architecture. Consequently, the assessment results could not be considered representative from a disciplinary point of view, and the results could not be meaningfully aggregated at the university level, at least not in one round of program review.

Early on, the Faculty Director of the Self-Study and associate deans considered the application of rigorous methods of sampling and calibration and quickly concluded that this level of rigor would not be possible at the university level. They hoped to aggregate quantitative results at the college level, but even this modest ambition proved unworkable given the latitude with which programs approached the assessment and the resulting variation in the results.

Still, the associate deans entered this process united in the conviction that the conversations provoked at the program level were as important as any other possible result of SP2, and this did prove to be the case. Even programs that approached the assessment with some reluctance found it useful to give the senior project their sustained attention during a time of heightened focus on issues of capacity and educational effectiveness. In addition, if SP2 did not always produce institutional results, certainly not as the result of a direct assessment, SP2 did produce qualitative and quantitative results at the program level as evidenced by the individual review documents and by the summary reports produced by the associate deans (see *Appendix 1.6*). Both the review documents and summary reports informed the following statement of findings and best practices.

WASC Capstone Rubric. The evidence of the program review documents suggests that the capstone rubric was helpful in articulating the conditions under which the faculty could use the senior project to assess the attainment of program learning objectives. One notable practice to emerge was the use of a student survey to assess the senior project along the rubric's dimension of the "the student experience." The assessment thus helped the project reach a higher level of development where, as the rubric states, students "may participate in refining the experience" of the capstone.

Some programs did have trouble applying the rubric; one in the College of Liberal Arts objected to the discreteness of the statements, rightfully pointing out that development in any of the rubric's five dimensions is a continuous process but assuming that a program could not find itself between one defined stage and another. This response suggests that the campus may benefit from additional instruction in the purpose and use of rubrics so that they are regarded not as institutional straightjackets but as heuristic tools to be used critically.

A program in the College of Science and Math found the capstone rubric difficult to use "because not all 'capstones' are going to include the same breadth and depth of experiences from one student to the next." Another in Liberal Arts observed, "Faculty members seem to view learning objectives as synergistic rather than discrete constructs. Each outcome described in the department's set of program and student learning objectives potentially comes into play in any senior project; which objectives and to what degree is a function of the individual project." These two programs seemed to take the discovery of variation in the senior project as the sign of a problem with the rubric rather than with the project; a view of the rubric as a heuristic tool might have allowed the programs to consider the implications of variability. For example, a number of programs in the College of Agriculture concluded that project variation was affected by the amount of supervision provided by the faculty, which pointed to a possible area of improvement.

During the self-study, it became clear that neither the WASC capstone rubric nor the other rubrics used in SP2 were designed to address integral learning, which is strongly associated with capstone experiences. In its *Integrated Learning VALUE Rubric*, the AAC&U defines this learning as "an understanding and a disposition that a student builds across the curriculum and co-curriculum, from making simple connections among ideas and experiences to synthesizing and transferring learning to new, complex situations within and beyond the campus." This definition suggests a set of considerations about student learning that may not coincide with the attainment of any particular ULOs. In the future, in assessing the senior project as a capstone experience during program review, the university may wish to encourage programs to apply either the capstone rubric or a version of the Integral Learning VALUE Rubric, depending on program need.

Sampling. This proved to be one of the biggest challenges to effective assessment of the senior project**.** The faculty director and associate deans considered the issue at length and finally concluded that they would not make specific recommendations to the programs. As a result, there was considerable variation in the way programs defined populations and created samples, which made it difficult to assign equal significance to the results. In the College of Agriculture, for example, two programs collected all the projects completed in a single year, giving them a large and representative sample (a census). In contrast, two other programs created samples from projects either provided by faculty members or archived in Kennedy Library's Digital Commons; the results were small and unrepresentative. A policy of archiving all projects, at least for internal use, would make it easier for programs to sample artifacts over a period of years, let alone from a single cohort.

Calibration, Scoring, and Reliability. If there are to be further rounds of SP2, there is probably no alternative to providing clear and workable guidelines in this area. All programs need to engage in calibration (norming) exercises like the one originally recommended in the guidelines to ensure that, at least at the program level, faculty members employ the same standards and apply them consistently.

Given the challenge of calibration, checks for inter-rater reliability might seem beyond our present capacity, but the measures employed by one program in the College of Liberal Arts were simple, effective, and reproducible. These included tracking rater agreements/disagreements and calculating a percentage based on the number of agreements per project trait. An analysis of the results showed that one faculty member was involved in most of the disagreements. The program discarded that rater's data and redistributed the projects for an additional reading. The result was agreement in all of the affected instances and a final reliability rating of 92%, which the program considered acceptable.

One problem that emerged in the scoring process at large was the resolution of rater disagreements. The guidelines recommended a blind reading of each senior project by two faculty members with the introduction of a third "expert" reader when the initial ratings varied by more than one point in any dimension. When programs reported their raw scores for analysis, some reported two sets for each project, while others reported an average score that, in the case of a one-point difference, made it impossible to state results as a distribution across categories, as the institutional researcher had recommended. Both the programs and the self-study have tended to report average scores, so the university should resolve this issue before engaging in further institution-level assessment.

Writing and Critical Thinking Rubrics. In general, it appears that the University Expository Writing Rubric was an effective instrument for interdisciplinary application to written projects or projects with a significant written component, which comprise the vast majority of projects according to both of the EER surveys. Nevertheless, some programs still found the writing rubric difficult to apply because they had not designed the project as an artifact of writing skills. Others found it necessary to edit the rubric; for example, one program in the College of Science and Math altered the dimension of style to value concise rather than complex sentence structure and language in proposal writing. Programs in Agriculture and in Science and Math were troubled by the fact that a written project might be the result of a long, intense process of collaboration between the student and faculty advisor. Frequent and intrusive editing raised the question of whose work was actually represented by the final product—an issue that a writing expert could help to address. This question led to a larger one about the faculty's approach to the capstone experience, which the associate dean in Agriculture described in this way: "Is [the] senior project to be used as an opportunity to teach the student (provide a lot of feedback, correction, editing of writing) or assessment of what the student is capable of performing? The answers to this question would determine the appropriate value of the senior project as an assessment artifact."

The Critical Thinking VALUE Rubric was more troublesome because it did not always correspond to a discipline-specific understanding of a complex skill. Faculty members from the College of Science and Math were particularly troubled by the rubric's use of the term "imaginative" to describe a student's desired position as a writer, and one program responded to this and other issues by carefully reworking the rubric. Faculty members were also challenged by the fact that, from the college perspective, students demonstrate critical thinking not so much in an artifact (the proposal or report) as in a performance (the bench work), a situation that suggests an interesting nexus between, say, Chemistry and Theater Arts. One Science and Math program asked whether a faculty member who had not witnessed the performance could adequately assess the student's skill attainment and came to the conclusion that only the student's research advisor was qualified to do so.

A number of programs in the College of Liberal Arts turned to entirely different VALUE rubrics (creative thinking, inquiry and analysis) as a better fit for their disciplinary perspectives. Programs in Agriculture and in Science and Math

complained about the need to apply two different rubrics to one project. They asked, in essence, whether they were supposed to conduct a single assessment or a double one. The question is pertinent because campus experience has shown that skills that are divided in theory, as in the ULOs, are not always divided in practice. One program in Liberal Arts noted an area of overlap between the writing rubric's dimension of support and the critical thinking rubric's dimension of evidence. "The two rubrics used considerably different language in addressing the way conclusions were supported," which the program said produced some disparity in the results.

The expository writing rubric incorporates a great deal of critical thinking, while much of what we think about critical thinking is deeply associated with ideas about verbal argumentation, which do not necessarily encompass non-verbal forms of persuasion. This observation suggests two possibilities. One is that the assessment of writing and critical thinking at the institutional level may well be effectively integrated in a single rubric that seeks to encompass both writing and the form(s) of critical thinking proper to writing. The other is that discipline-specific forms of critical thinking may in the long run be better assessed at the program than the university level.

These adaptations were all to be expected because the critical thinking rubric had undergone no development on campus, in contrast to the writing rubric, and the assessment could be considered only the beginning of an institutional conversation on the subject of critical thinking. Whether it is possible for all academic programs to share a definition of critical thinking, as they seem to be able to share a definition of expository writing, remains to be seen. The discussion would seem to be worth having, however, as it would challenge the university to be more articulate about the ways it defines critical thinking, just as SP2 challenged the institution to think more deeply about the capstone experience.

Recommended Action Items

11. **Review all university- and program-level senior project policies to ensure their currency and to ensure that all programs understand and implement these policies (p. 14).**
    - Ensure that all programs provide their students with a written policy on the senior project that includes expected learning outcomes.
    - Ensure that all programs design their senior projects to have a reasonable size and scope.
12. **Revise the Senior Project Policy to clarify the nature of the capstone experience in relationship to the ULOs, using the evidence provided by the EER report (15).**
    - There are some ULOs that, because of their importance and pervasiveness, the university should expect every program to address in its senior project; these include disciplinary expertise, writing, critical thinking, and lifelong learning.
    - Develop the idea of the capstone as a bridge between an undergraduate education and a student's later personal and professional life.
    - Conduct the EER Student Survey at regular intervals to provide a campus benchmark for improvement.
13. **Promote greater consideration by the academic programs of the less highly ranked skills—creative thinking, oral communication, contextual understanding, group work, and reasoned decision-making on the basis of shared values—in the senior project and in the curriculum at large (17).**
    - Promote a campus conversation on integrative learning that addresses the contribution of GE to the senior project.
    - Develop a campus version of the Integrative Learning VALUE Rubric and revise the program review guidelines to promote its use.
    - Develop a GE capstone experience as a way for all students, both native freshmen and community-college transfers, to integrate and apply what they have learned about "the larger world of the arts, science, and technology" before they undertake their senior projects; an e-portfolio could be the appropriate vehicle.
14. **Retain an institutional focus in program review on the demonstration of highly-developed or mastery-level skills in the senior project (18).**[viii]
    - Encourage programs to improve their senior projects as a central artifact of assessment using the WASC capstone rubric as a guide.

- Ask programs to explain the contribution of their senior projects to their overall assessment plans.
- Offer the EER Student Survey as a benchmarking instrument to be used at the program level.

15. Continue to investigate the data presented in this chapter.

- Analyze the relationship between senior project form and the activities related to high-impact educational practices, contribution to ULO achievement, and integrative learning as described in the survey.
- Analyze the representativeness of respondents in terms of GPA.

Student Success

Cal Poly embraces a broad conception of student success that incorporates degree acquisition, attainment of the University Learning Objectives (ULOs), and achievement of whole-system thinking. In this sense, student success is one of four key principles that give rise to the university's values and vision. The current chapter considers student success in the numerical but nonetheless important sense defined by WASC and the federal government: a set of indicators such as graduation and retention rates that measure progress to degree. The university's analysis of these indicators and the resulting program and policy changes are discussed here.

In general, this chapter addresses aspects of Standard 1, Defining Institutional Purposes and Ensuring Educational Objectives, which include the institution having a system of measuring student achievement (CFR 1.2), responding to diversity (1.5), demonstrating that its academic programs can be completed in a timely fashion (1.7), and exhibiting integrity in its operations (1.8). This chapter also addresses aspects of Standard Two, Achieving Educational Objectives Through Core Functions, which include the institution collecting and analyzing student data (2.10) and ensuring that all students understand academic requirements and receive appropriate advising (2.12), as well as student support services being designed to meet the needs of specific students and curricula (2.13). Finally, the section on diversity training addresses one aspect of Standard 3, Developing and Applying Resources and Organizational Structures to Ensure Stability, which is maintaining appropriate faculty and staff development activities (3.4).

Retention and Graduation Rates

Almost every year in the decade since the last WASC reaffirmation in 2000, Cal Poly's six-year graduation rate has grown, from 65% for the Fall 1996 cohort of first-time freshmen (FTF) to 76% for the Fall 2005 cohort. There were even greater though slightly less consistent increases in the four- and five-year graduation rates (see *Figure 2.1*). Throughout this period, Cal Poly has made intentional efforts to facilitate graduation, culminating in a number of recent initiatives discussed below. However, due to limited institutional research capacity, the university has not been able to analyze how much of the growth can be attributed specifically to these efforts. For example, the average GPA of entering freshmen has been increasing along with graduation rates, but the institution has not been able to isolate the effect of that increase (see *Figure 2.2*).

Cal Poly's six-year graduation rate has remained the highest in the CSU since the previous WASC self-study. However, it has regularly lagged behind those of many other highly selective universities, including most of the UC campuses. Consequently, the university has set two graduation rate goals: 80% by the end of AY 2015-16 for all identity groups and 90% as a longer-term goal. While non-STEM programs at Cal Poly nearly meet or exceed the 80% goal for most identity groups, it is a significant stretch for most under-represented minority (URM) groups in many STEM programs, e.g., Latino students in the College of Engineering (see *Figure 2.3*).

As part of a nationwide effort by the Education Trust called Access to Success, Cal Poly has looked at three indicators of disadvantage: race/ethnicity (a cultural/demographic indicator), first-generation status (an indicator of parents' educational attainment), and Pell Grant status (a socioeconomic indicator). Early analysis has revealed that students identified as disadvantaged by all three indicators have substantial six-year graduation rate achievement gaps (see *Figure 2.4*). Furthermore, Cal Poly has looked at URM achievement gaps after the freshman year and found that they were decidedly narrower than those in later years. An analysis of year-to-year retention/persistence rates for URMs vs. non-URMs in the Fall 2004 FTF cohort revealed a large jump in the gap between both the second and third and the fifth and sixth years; i.e., most students return for their second year, but fewer URMs than non-URMs return for their third year. The same holds true when comparing those who return for their fifth versus sixth year, indicating that disadvantaged students are persisting early on and leaving the university later in their educational careers. The other two indicators revealed similar patterns (see *Appendix 2.1*). The university's next step is to find the cause of the achievement-gap jumps in those populations and develop appropriate interventions.

Cal Poly Initiatives

During the past decade, the university's efforts to facilitate graduation have included reducing total units required for degree completion, taking steps to identify and mitigate or eliminate "bottleneck courses," exploring ways of increasing student success in courses with high rates of Ds and Fs, and placing students in supplementary workshops in science or math based on mid-course assessments of their academic performance. During the last three years, the university has

pursued several new initiatives aimed at removing barriers to timely graduation. These initiatives were based on the recently adopted Student Success Guiding Principles (see *Appendix 2.2*).

Policy Changes. To support student success and produce financial savings, Cal Poly reviewed many of its policies for possible changes. Beginning in AY 2009-10, working groups comprised of associate deans, faculty members, the Academic Senate Chair, advising professionals, and representatives from Admissions, ITS, and the Office of the Registrar worked on a number of inter-related policy changes to ensure equitable and predictable treatment of students across colleges. The working groups sought broad campus input before finalizing the policies.

One such group worked with the Academic Senate Curriculum Committee to produce a more streamlined *Change of Major Policy*, which the Senate adopted in March 2010. This revised policy was no small accomplishment for a campus where academic units value their autonomy and students declare a major on matriculation. Though many majors are still impacted and students must continue to meet the academic requirements of their current majors, the new policy encourages them to begin the change-of-major process earlier in their careers. The policy now requires an agreement between the individual student, the current program, and the target program that clearly outlines the requirements for transfer into the new major and establishes a maximum two-quarter calendar for completion of the process. This agreement represents a significant improvement over the former policy, under which the current and target programs could have required the student to meet conflicting conditions. In addition, the Office of the Registrar has automated the process to make change-of-major information more accessible to students. Evaluating the impact of the new policy will take time, but the university plans to track whether students who change major under the new policy graduate with fewer total units, which would be a measure of success.

In Fall 2010, a second working group developed the *Expected Academic Progress Policy* (EAP), which establishes percentages of total degree units that students are expected to complete each year and places a cap on the number of units students may complete beyond the number required for their degrees. The EAP is not intended to determine academic probation, a negative measure, but is rather to be used to communicate the university's expectation that students graduate on time by providing a clear, positive measure of degree progress. Students who do not make sufficient progress may be required to meet with their academic advisor. One of the EAP's ramifications may be to limit students' opportunities to change major as the total unit cap makes it difficult for them to change late in their college careers. The details differ for native and transfer students, but the understanding is the same: the university is unable to serve new students when enrolled students do not graduate on time.

Also in Fall 2010, a third group revised the *Academic Probation and Disqualification Policy*. The new policy makes the criteria for both academic probation and disqualification simpler and more consistent across programs and colleges. In addition, students on academic probation and subject to disqualification will receive official notification of their status from the Office of the Registrar rather than from their dean. Students will have a variety of tools at their disposal, including PolyProfile, an unofficial, electronic transcript available through the My Cal Poly web portal. Beginning in Spring 2012, PolyProfile will indicate students' academic progress as measured by the EAP. The university hopes that the number of disqualified students will drop as a result of all of these policy changes, but it will take time to collect data and verify results.

Course-Level Efforts. In order for these success-oriented policies to work as planned, students must have access to courses that fulfill their degree and graduation requirements and they must choose to enroll in these courses. Because of the budget crisis, Cal Poly could not simply increase the total number of course offerings. Instead, the university focused on methods to ensure that a greater percentage of courses offered were those that directly assist students in their progress to degree. The Office of the Registrar analyzed the current catalog, identified courses that meet a specific degree requirement, and provided the academic deans with this information to help them determine which courses programs should offer. In addition, all academic programs reviewed their prerequisites, which were then coded into the registration system to ensure that students take courses in their intended order and that prerequisite courses are available to those who need them. These measures should both facilitate student learning and promote timely graduation, although their long-term effect remains to be assessed. Average unit loads jumped in AY 2009-10 and remained at a heightened level during AY 2010-11, though they fell again in Fall 2011. Increased unit loads may indicate that students have more access to the courses they need to graduate, although other factors may also contribute to the increase; e.g., higher fees may raise the incentive to graduate quickly.

In another attempt to increase student success while cutting costs, the provost encouraged programs to decrease the number of courses students repeat, thereby making instructors available to teach other courses. These efforts have been ongoing in the College of Science and Math through two programs, Study Session and Supplemental Workshops in Math and Science, which are offered in partnership with Student Academic Services. Addressing first- and second-year high-demand courses with historically high fail rates, these programs have been growing; in AY 2010-11, over 3600 students participated and achieved 86-91% A/B/C/CR grades in science, math, and engineering courses. Also during 2010-11, the College of Engineering identified courses with high fail rates and offered early tutoring to students experiencing difficulties. Data on the fail rates in Civil and Mechanical Engineering courses indicate that failure rates went down from AY 2009-10 to 2010-11 for all four courses tracked (see *Figure 2.5)*. In two cases, the rates had already been declining, perhaps due to changing student attitudes resulting from the new Academic Probation and Disqualification Policy. Still, the results are positive enough to encourage the Chair of Mechanical Engineering to expand the program.

Advising Initiatives. During AY 2009-10, the university identified over 1200 students with a high number of Cal Poly units. Though not required to do so, these "super seniors" had the option of having their courses block-scheduled so that they could graduate in three quarters—an exercise in intrusive advising that yielded positive results. Approximately 70% of the students graduated in Spring 2010; 16% left Cal Poly either voluntarily or by disqualification; and 14% remained enrolled. In AY 2010-11, the university decided not to repeat this advising effort because the number of super seniors was much smaller and the program was resource-intensive. The Office of the Registrar will continue to monitor the number of students in this group, and the university will decide what measures are appropriate on a year-to-year basis. In the meantime, the institution has learned from this undertaking, and first-time freshmen are now block-scheduled into a full course load during their first quarter at Cal Poly in order to give them a solid foundation for timely graduation. The university is also considering the use of predictive scheduling such that students would request the classes they need for the upcoming quarter, and the class schedule would be built around their needs.

During the last few years, the university has worked to create common advising standards and integrate advising efforts across campus. For instance, the Academic Advising Council, comprised of college and campus advising professionals, developed the *Mission Statement for Academic Advising* as well as *Academic Advising Student Learning Outcomes* (ALOs). These documents are incorporated into the *Advising Syllabus*, which the Academic Senate endorsed in Spring 2011. The ALOs will serve as the basis for coordinated advising efforts beginning with the summer orientation program and continuing throughout students' careers. Following an assessment workshop during Summer 2011, several advising units on campus began developing measurable procedures based on the ALOs with the intention of collecting assessment data at the end of AY 2011-12.

To facilitate this integration, the university recently filled the new position of Assistant Vice Provost for University Advising. She is building connections between various independent activities by focusing on the following efforts: bringing consistency to advising information across campus, providing an institutional perspective on how advising can support degree progress, and promoting advising as a form of instruction that builds skills rather than simply conveys content.

One promising, campus-wide effort is the Freshman Success Program. Using Customer Relations Management software, the university ran a pilot intervention with a treatment and control group of FTF in four colleges during AY 2009-10 and then implemented a full program for all FTF on academic probation (AP) in 2010-11. In the 2009-10 pilot, the control group received the same services each college had offered in the past. In the 2009-10 treatment group, students on AP at the end of fall quarter attended mandatory workshops and received academic coaching during winter quarter. Information gathered in spring quarter for both groups showed statistically significant increases in the treatment group's self-efficacy, spring enrollment, and GPA; students on AP in 2010-11 showed similar results (see *Appendix 2.3* for statistical analysis). Encouraged, the assistant vice provost plans to expand the program beyond first-year students.

It appears that all of this work has already born some fruit. On the 2008 NSSE, Cal Poly senior respondents rated the quality of academic advising at 2.70 on a scale of 1 to 4 with 1 being poor and 4 being excellent. This was lower than their CSU peers (2.74) and significantly lower than their polytechnic (2.86) and NSSE (2.85) peers. In 2011, however, Cal Poly senior respondents rated the quality of academic advising at 3.01, significantly higher than their CSU (2.85) and NSSE (2.94) peers but not significantly higher than their polytechnic peers (2.97). The increase in Cal Poly's mean score far exceeds those of all peer groups.

First Year Experience (FYE) Programs. These have existed at Cal Poly since the 1970s. Current efforts include FYE courses offered by academic departments; *First Year Seminars* designed to assist low-income, first-generation, and/or physically disabled students; and PolySuccess, an opt-in program that includes opportunities for peer mentorship, faculty workshops, and a weekly electronic newsletter. However, not unlike other student-success-centered efforts at Cal Poly, FYE programs have often functioned independently rather than as unifying experiences for all first-year students.

Because of the overlap and proliferation of FYE programs, the university faces challenges in analyzing their impact. Very few if any first-year students are not involved in at least one, leaving no comparison or control group. In addition, students participate in different combinations of programs, making it difficult to connect student success to a specific experience. As a result, while FYE programs may contribute to the university's 93% retention rate for Fall 2010 FTF, measuring their exact contribution is not currently feasible.

The institution can, however, do some limited analysis of the effect of living on campus. Because virtually all FTF now live on campus, no current population comparisons can be made. During AY 2007-08, however, over a quarter of FTF lived off campus, providing a control group. Living on campus appears to have had a positive and lasting effect on Fall 2007 FTF persistence rates with 92% of those who lived on campus returning in Fall 2008 compared with 83% of those who lived off campus. By Fall 2010, those who had lived on campus as Fall 2007 FTF had a 77% persistence rate compared with 65% for those who had not.

The *Learning Community Programs* within University Housing may be a factor in these higher persistence rates. The program provides direct connections with faculty in specific academic departments and engages freshmen in high-impact educational practices. All freshmen in the residence halls are organized into living-learning communities that give students the opportunity to engage in their colleges in a focused and personalized way. Some unique benefits are:

- Participation in a living environment that expands upon the academic experience and supports academic excellence through club fairs, study sessions/groups, honors banquets, class registration events, off-campus trips specific to individual academic interests, and other activities.
- Specialized guidance regarding career options/planning.
- Opportunities for increased social support/interaction and active involvement with faculty, peers, and academic support staff.

In addition, all sophomores living on campus participate in the *Sophomore Success Program*, which is designed to build on the foundation of FYE. Of those in the Fall 2009 FTF cohort who lived on campus their first year, 56% of those returning lived on campus their second year, and 44% lived off campus. In Fall 2011, 91% of those who lived on campus both years returned as juniors compared with 84% of those who lived off campus the second year. Again, though the specific effects of the Sophomore Success Program have not been isolated, it may be a contributing factor to the increased success of sophomores living on campus. Overall, the data collected to date indicate that living on campus positively associates with student success.

WASC Recommendation: Continue to Enhance Diversity with Attention to Campus Climate

Cal Poly has long been engaged in a variety of efforts to close the achievement gap and promote diversity learning. The university has recently realigned these efforts around the AAC&U's program of *Making Excellence Inclusive*. In Spring 2009, the Academic Senate passed AS-682-09 *Resolution on Making Excellence Inclusive at Cal Poly* in support of the program. In 2010, the former president created the position of Associate Vice President for Inclusive Excellence with responsibility for the new Inclusive Excellence Office, and the former University Diversity Enhancement Council refocused its efforts as the Inclusive Excellence Council.

The new president has repeatedly and consistently expressed his belief that the Cal Poly community should more closely mirror the world in which graduates will live and work. He recognizes that the campus climate affects the university's ability to recruit and retain a more diverse population of students, staff, and faculty, and he has asked for both more information about the climate and further efforts to improve it. The president recently reorganized university leadership in this area to underscore his belief that everyone is responsible for addressing diversity and campus climate issues. Accordingly, he eliminated the separate Inclusive Excellence Office and added to the responsibilities of the existing

Employment Equity Director those of Special Advisor to the President for Diversity. Her duties will include tracking and measuring the effectiveness of Inclusive Excellence initiatives throughout the university.

Campus Climate. Based on preliminary surveys as well as historical documents, focus groups, open forums, and the expertise of committee members, the Campus Climate section of the 2000 Cal Poly Self-Study reported that:

- Most of Cal Poly's 345 student survey respondents, including many URMs, were proud of being affiliated with the university.
- Most student respondents were not conscious of hurtful incidents related to race, ethnicity, sexual orientation, etc., although they were more likely to have been conscious of such incidents when sex/gender was a factor.
- Some students, especially students of color and members of the LGBTQ community, had encountered incidents of perceived or actual discrimination or insensitivity related to race, gender, sexual orientation, or disability. Some women, especially in nontraditional majors; lesbians; gay men; older, female, re-entry students; and students of color expressed feeling unwelcome at Cal Poly. Some women indicated that they were subject to gender and sexual harassment from faculty and peers. Some were afraid to report this behavior because they felt that to do so might endanger their futures, grades, or references for jobs or grad schools.
- Of the 266 faculty survey respondents, 58% reported experiencing or witnessing hurtful incidents in the academic work place with regard to sex/gender, followed by 50% who said the same for race/ethnicity, 47% for cultural heritage, 43% for socioeconomic factors, 40% for sexual orientation, and 34% for disability. The corresponding percentages for the 411 staff respondents were significantly lower, ranging from 12% for sex/gender to 11% for socioeconomic status.

Although the 2000 self-study was not followed by a valid, comprehensive, campus climate assessment, Cal Poly has participated in some systematic surveys that partially address climate issues. These include Your First College Year (YFCY), a national survey administered by the UCLA Higher Education Research Unit (HERI); the National Survey of Student Engagement (NSSE), in which Cal Poly generally participates every three years; Speakout, a one-time survey administered by Cal Poly's Counseling Services in 2008; the national Healthy Minds Survey, administered by the University of Michigan School of Public Health in partnership with the multidisciplinary University of Michigan Comprehensive Depression Center and Survey Sciences Group; and Diverse Learning Environments, a new HERI survey administered to sophomores and juniors in 2011 at the same time that the NSSE was administered to freshmen and seniors. We know from academic disciplines that rely heavily on ethnographic research that some survey respondents and focus group participants do not reveal all the details of their experiences, particularly when sensitive issues are involved. Nevertheless, the 2000 self-study findings and the more recent survey results provide a starting point for understanding the climate at Cal Poly.

Overall satisfaction. Most Cal Poly students appear to be quite satisfied with the university. The 2011 NSSE had 664 freshmen and 1549 senior respondents; when asked whether they would choose the same institution if starting over, Cal Poly freshmen and senior respondents both rated the university significantly higher (3.55 for freshmen and 3.53 for seniors on a scale of 1 to 4 with 1 being definitely no and 4 being definitely yes) than their CSU (3.12 and 3.10), polytechnic (3.37 and 3.32), and NSSE (3.26 and 3.21) peers. This finding is consistent with the observation that participants at Black Commencement consistently express pride in receiving Cal Poly degrees. They also comment, however, that they had to overcome significant challenges.

Integration/Segregation/Discrimination. In the 2005 YFCY study, which had 855 respondents, Cal Poly freshmen disagreed or strongly disagreed less often than respondents at all other institutions with the statements, "I have been singled out because of my race/ethnicity, gender, or sexual orientation," "I have heard faculty express stereotypes about racial/ethnic groups in class," and "There is a lot of racial tension on this campus." In addition, when asked in the 2011 NSSE about the extent to which the institution encourages contact among students from different economic, social, and racial or ethnic backgrounds, Cal Poly freshmen rated the university at 2.57 and seniors at 2.26, both improvements on scores in past NSSE surveys but still significantly lower than their CSU (2.81 for freshmen and 2.62 for seniors), polytechnic (2.74 and 2.51), and NSSE (2.74 and 2.56) peers. However, Cal Poly YFCY respondents stated more often than other respondents that they had "dined or shared a meal," "shared personal feelings and problems," "had intellectual discussions outside of class," "studied or prepared for class," and "socialized or partied" with students from a racial/ethnic group other than their own.

In the Speakout survey, which had 3486 respondents, the majority (60%) disagreed or strongly disagreed with the statement, "I view the campus community as racially and culturally integrated, without issues of racial/ethnic/cultural 'clustering,' separation, or segregation," while a minority (20%) were neutral. In the same survey, however, an overwhelming number of respondents agreed or strongly agreed with or were neutral toward the statement that they are "treated like other Cal Poly students;" i.e., they do not feel discriminated against because of their gender (91%), sexual orientation (90%), ethnic/racial background (89%), nationality (90%), or disability (93%). The number who do not feel discriminated against because of their religion was somewhat smaller (73%). Because the university has not disaggregated the survey data by ethnicity, we do not know what percentage of URM respondents felt discriminated against based on ethnic/racial background.[i]

The same pattern of mixed results emerged from the Healthy Minds survey, which had 1420 Cal Poly respondents. 77% reported never having been treated unfairly because of race, ethnicity, or culture in the past year, as compared to 68% nationally. However, 23% of Cal Poly respondents said that they had been treated unfairly once in a while, sometimes, or a lot. When asked, "Have you been the target of obvious, direct, 'in your face' discrimination because of your ethnicity or race," 79% said never, and 6% said sometimes to very often (9% for males and 5% for females). On the other hand, when asked, "Have you been the target of subtle, indirect, not-so-obvious, 'deniable' discrimination because of your ethnicity or race?," 19% said sometimes to very often (20% for males and 18% for females).

In summary, evidence collected to date suggests that while most students do not believe that the campus climate is a problem, there is a fraction that does. While major bias incidents seem to be relatively rare, mostly informal observations made by students of color, members of the LGBTQ community, and others suggest that "micro-aggressions" are not unusual, both on campus and in the surrounding community. Micro-aggressions are brief and commonplace, daily, verbal, behavioral, and environmental indignities, whether intentional or unintentional, which communicate hostile, derogatory, or negative racial, gender, sexual orientation, and religious slights and insults to the target person or group. All these data add to a sense that Cal Poly is not as welcoming as it might be to students who are different. This situation needs to be assessed on an ongoing basis.

WASC Recommendations on Recruitment and Retention. Although the absolute numbers of URMs enrolled at Cal Poly during the past few years have fluctuated with the total population, the URM share of that population has increased fairly consistently, indicating some success in recruitment (see *Figure 2.6*). The CPR visiting team suggested that "the university should engage in a more assertive analysis of enrollment data to determine if additional underlying causes are impacting the enrollment of accepted applicants." In fact, the Admissions Office regularly conducts such analysis, using data from sources like the Admitted Student Questionnaire administered by the College Board and phone surveys of all admitted National Hispanic Recognized Students and National Merit Finalists. To date, the analysis has suggested that the following factors are very important to students—attractiveness of campus, quality of social life, quality of academic programs, availability of recreational facilities, and quality of on-campus housing and surroundings—and that Cal Poly typically rates lower on these factors than our competitors do. However, the analysis has also suggested that our yield of admitted URM students, which for FTF is significantly lower than our yield of white students (see *Figure 2.7*), is usually most affected by the scholarship packages of our competitors. Specifically, although the fees at UC campuses are significantly higher than those at Cal Poly, the UCs consistently offer scholarships—not always based on need and typically renewable throughout the student's college career—that reduce the net cost of attendance below Cal Poly's. The university currently lacks the resources to match this level of support, although the president has stated that scholarship funding will probably be a high priority for future advancement efforts. Targeting of scholarships toward URM applicants appears to be possible, even under Proposition 209, if private alumni groups administer the scholarships independent of the university.

The visiting team also suggested that Cal Poly analyze the impact of the Multi-Criteria Admissions (MCA) scoring system on applicants of color over time. Cal Poly can and does add cognitive as well as non-cognitive variables, such as father's level of education and Partner School attendance, to the selection criteria required by the CSU. An analysis conducted for Fall 2008 and Fall 2009 FTF showed that URMs benefit both from the non-cognitive variables included in the MCA and from bonus points that are awarded in the second run of the MCA system, based on an applicant's place of residence, Partner School attendance, and parents' highest level of education. The team questioned the MCA's reliance on GPA scores that incorporate weighting of both advanced placement scores and test scores, which correlate with family income, but these are dictated by CSU policy and cannot be changed at Cal Poly's discretion.

Finally, the visiting team questioned how CSU-driven enrollment reductions "will affect minority acceptance rates and retention in the coming years," especially given discussions at Cal Poly about reducing and/or eliminating many remedial academic programs. In fact, the university chose for the most part to address the need for enrollment reductions not by reducing acceptance rates but rather by increasing throughput, i.e., by helping more students graduate on time. Because of stringent admissions criteria, virtually all Cal Poly students including URMs are prepared to start college-level classes; consequently, rather than offering separate remedial programs, the institution is focusing on careful advising, appropriate placement, and continuing support as needed. Future retention and graduation data, already routinely collected and analyzed, may demonstrate the effectiveness of this approach.

Diversity Training. In Summer 2010, thirty-three faculty and staff members completed a three-day "Training of Trainers" workshop that focused on diversity knowledge and skills. During AY 2010-11, units in Academic Affairs and Student Affairs as well as a few student organizations requested a total of twenty-two presentations from these new trainers, ranging from fifteen-minute drop-ins to hour-and-a-half-long workshops. On a scale of 1 to 5 with 1 being disagree and 5 being agree, an early audience gave a 2.5 rating to the statement, "Overall, I feel that this presentation was worthwhile." Later audiences typically gave this statement a rating between 4 and 5. According to written comments, many participants found the most helpful aspects of the presentations to be Inclusive Excellence-related discussions among peers and stories of individuals' experiences with stereotyping and other micro-aggressions.

In addition, the Inclusive Excellence Office co-sponsored quarterly workshops with the Center for Teaching and Learning—one on stereotyping, a second on incorporating diversity in STEM curricula, and a third on the purposeful design of student teams to promote diversity learning. Participant evaluations suggest that all three workshops were generally well received.

Intergroup Dialogues. Introduced at the University of Michigan more than twenty years ago, the Intergroup Dialogues (IGD) program employs a guided and structured model to engage members of different social identity groups in face-to-face interactions. The model is effective in developing intergroup understanding by helping students explore their social identities and statuses, the role of social structure in relationships of privilege and inequality, the development of empathy and motivation to bridge differences, and the role of personal and social responsibility in leading to greater social justice.

Cal Poly began a full-scale IGD pilot in AY 2010-11 following a workshop conducted by Michigan experts and experimental offerings through Cal Poly's Honors Program. During Winter 2011, an external consultant conducted a ten-week "train the trainer" for graduate students, staff, and faculty members, all of whom were asked to complete pre- and post-training self-assessments in the areas of knowledge, awareness, skills, and commitment/passion. In each area, average ratings increased significantly.

Seven IGD sections were offered in Fall 2011 for undergraduates pursuing a variety of majors, two as a mandatory component of a particular United States Cultural Pluralism class in Agribusiness and five as a graded option in several other cultural pluralism classes in Ethnic Studies, Economics, and Food Science and Nutrition. Three of the IGD sections focused on race and ethnicity while the remaining four focused on gender. Doctoral interns in the Counseling Center and graduate students who had completed the winter training facilitated the dialogues. Section facilitators collected assessment data that will be analyzed to determine whether IGD should be implemented on a broader scale.

Louis Stokes Alliance for Minority Participation (LSAMP). Cal Poly offers several long-standing programs that assist targeted groups of students in achieving academic success. These include the *Educational Opportunity Program*; *Student Support Services*, a TRIO program; *Connections for Academic Success*, a support program for students from Partner Schools and other student groups; the Multicultural Engineering Program; and Athletics Advising. More recently, the university became a participant in the NSF-funded LSAMP, a comprehensive, statewide project dedicated to increasing the number of URM students who graduate from the CSU with baccalaureate degrees in STEM disciplines. LSAMP emphasizes the goals of increasing graduate school preparedness, conducting interventions for community college transfer students, and expanding opportunities for student engagement in international activities. Undergraduates who face social, cultural, educational, or economic barriers to careers in STEM are eligible for the program. At the end of AY 2010-11, Cal Poly had approximately 100 students enrolled in the program, many of whom were honored at Cal Poly's annual LSAMP recognition ceremony for significant achievements in academic performance and undergraduate research. Several have been accepted into graduate school, and one won first place in his division at the statewide CSU Research Competition in Fresno.

Ombuds Office. The Office of Student Ombuds Services was established in February 2010 under the direction of the Associate Vice President for Inclusive Excellence. The office, which now reports to the president, offers a safe place for students seeking assistance with any university-related issue, not only those that are diversity- or climate-related. Use of its services is voluntary, and all communications are confidential, informal, impartial, and independent, in accordance with the policies and practices of the International Ombudsman Association. The Associate Ombuds considered over forty cases in Winter and Spring 2011, and the caseload has grown in Fall 2011. As a result, the associate vice president has made several recommendations to the president regarding possible changes in university policies and practices.

Cultural Competence. Student Affairs, in partnership with the Center for Teaching and Learning and the Inclusive Excellence Office, invited Aaron Thompson, Senior Vice President for Academic Affairs at the Kentucky Council on Postsecondary Education, to visit Cal Poly in early May 2011. Dr. Thompson is a nationally recognized expert on diversity, cultural competence, and related topics and the co-author of several books including *Diversity and the College Experience* (2011). During his visit, he led a series of workshops for a university-wide audience and met with the president, the Inclusive Excellence Council and others. He covered topics such as the meaning of diversity, its importance, and the difference between diversity and cultural competence. He also presented his "Staircase Model" of incremental progress toward the achievement of cultural competence.

Following his visit, Dr. Thompson sent the president written comments regarding Inclusive Excellence at Cal Poly. He began by praising the campus for its efforts to increase diversity and cultural competence and applauded the commitment of staff, faculty, and leadership in both Academic Affairs and Student Affairs while urging a stronger bridge between the two. He expressed the need to ensure that the Inclusive Excellence plan permeates all areas. In keeping with the staircase model, Dr. Thompson presented a year-by-year curricular and co-curricular agenda for undergraduates that builds on a strong first-year experience and leads toward cultural competence. Finally, he suggested tactics for increasing diverse students' access to Cal Poly, such as summer academies, mentoring of school children by college students, deeper partnerships with community colleges, e.g., dual enrollment, and scholarships.

Recommended Action Items

1. **Investigate the cause of achievement gaps in retention and graduation between URM and non-URM students and devise appropriate responses (p. 22).**
2. **Study the impact on student success of the new policies described in this chapter, including their impact on the number of super-seniors (22).**
3. **Expand the Freshman Success Program beyond first-year students (24).**
4. **Integrate FYE programs to create unifying experiences for first-year students (25).**
5. **Assess campus climate on a regular basis using a valid survey instrument and other appropriate means (26).**
6. **Continue to investigate and address impediments to recruitment, retention, and graduation (27).**
    - Seek the resources needed to make Cal Poly more competitive in offering scholarships and other forms of financial aid to admitted students; specifically, encourage an organization independent of the university to raise funds and administer a scholarship program targeted at admitted URMs.
    - Continue and, if possible, expand participation in programs such as LSAMP that assist targeted groups of students in achieving academic success. Seek involvement in additional externally funded programs with similar objectives, such as the McNair Scholars Program.
7. **Continue and coordinate diversity training/learning for students, staff, and faculty (29).**
    - Use Aaron Thompson's "Staircase Model" to integrate campus efforts to expand cultural competence among students.
    - If justified by the results of the pilot, implement the Intergroup Dialogues program in a sustainable manner throughout the campus.
    - Build on the "Training of Trainers" initiative to further develop Inclusive Excellence awareness and skills among staff and faculty.

Organizational Learning

Student learning and student success may need clarification in relationship to each other, but both concerns are generally understood to be central to a university's mission. Organizational learning is less familiar but no less important. It is embodied in WASC Standard 4, Creating an Organization Committed to Learning and Improvement, which states that "the institution conducts sustained, evidence-based, and participatory discussion about how effectively it is accomplishing its purposes and achieving its educational objectives."

One major component of this standard is what WASC calls "strategic thinking and planning." This process has been underway at Cal Poly for nearly the entire period of the self-study, culminating with the appointment of a new president and the release in Fall 2011 of a statement of key principles and strategic imperatives (see *Strategic Planning* website).
The present chapter focuses on the other major component, which WASC calls the institution's "commitment to learning and improvement." Aspects include planning being informed by appropriate data (4.3), the institution employing quality assurance processes at all levels (4.4), the leadership's commitment to improvement (4.6), the staff and faculty's evaluation and improvement of teaching and learning (4.6), and the institutional inquiry into the same process (4.7). These are all considered through a WASC-required analysis of the Inventory of Educational Effectiveness Indicators and a consideration of program review in Student Affairs and Academic Affairs.

This chapter also addresses aspects of Standard 2, Achieving Educational Objectives Through Core Functions, which relate to the inventory and program review. These aspects include academic programs being appropriate to the degree (2.1), degrees being defined in terms of student achievement (2.2), learning outcomes being clearly stated at all levels (2.3), and, of course, programs being subject to systematic review (2.7).

Inventory of Educational Effectiveness Indicators

WASC expects the university to compile this inventory at the program and institution levels, with general education (GE) included as a program, during each phase of the self-study. Academic Programs has exceeded this expectation for each of the last five academic years by administering a survey that reflects the inventory's five categories of inquiry:

- Have formal learning outcomes been adopted?
- Where are these learning outcomes published?
- Other than GPA, what data/evidence is used to determine that graduates have achieved stated outcomes for the degree?
- Who interprets the evidence? What is the process?
- How are the program assessment findings used?

The results were intended to provide the equivalent of an annual assessment report for each academic program (see *Appendix 5.2 Excel file in EER Data Portfolio*).

The Inventory at the Level of the Institution. In AY 2006-07, the Academic Senate adopted the *University Learning Objectives* (ULOs), which define academic expectations for all graduates. The senate later adopted the Diversity Learning Objectives and Sustainability Learning Objectives, which expand on the ULO that relates reasonable decision-making to three sets of shared values. All these objectives are published on the ULO webpage and in the *Cal Poly Catalog*. In addition, academic programs undergoing review are expected to map their PLOs to their ULOs, their courses to their PLOs, and their courses and significant co-curricular experiences to the ULOs. A program of ULO-based assessment has examined student achievement in writing, oral communication, diversity learning, lifelong learning, and ethics, using direct and indirect evidence (see "Student Learning," pp. 2-11).

The Inventory for General Education. GE developed program goals for student learning that are published in the *Cal Poly Catalog*. GE also reviewed its *Educational Objectives and Criteria*, found them to be "too numerous and too vague to assess," and developed Focused Learning Objectives stated at the program level. The focused objectives align with the ULOs, with college learning objectives, and with AAC&U's LEAP Learning Outcomes, which the CSU has adopted as its GE Learning Outcomes.[i] The Educational Objectives and Criteria are still published online; implementation of the

Focused Learning Objectives has been delayed by governance concerns that resulted in the transfer of GE oversight from Academic Programs to the Academic Senate. As a result, the Focused Learning Objectives are not yet published, and GE has encouraged instructors to include the Educational Objectives and Criteria in their syllabi. GE assessment has been the foundation of the ULO-based assessment referenced above.

The Inventory at the Program Level. Conducting the inventory at the program level required an annual survey that Academic Programs normally sent to all academic departments at the end of spring quarter with the expectation that they would reply by the end of summer. The response rate for all graduate and undergraduate programs stayed above 90% in every year except AY 2009-10, when the office was late in sending the instrument and the rate plunged to 70%, making that year's results unrepresentative.[ii]

The inventory survey was an ambitious effort, but the instrument was flawed.[iii] The adoption of online tools like SurveyGizmo provided capabilities toward the end of the process that did not exist at the beginning, when the survey was form-based.[iv] Though the results were not thoroughly analyzed until now, the interpretation presented below should justify an institutional commitment to improvement in this area.

Have Formal Learning Outcomes Been Adopted? Where Are These Learning Outcomes Published? In response to these two WASC-required inquiries, Academic Programs developed a set of more specific questions focused on program learning objectives (PLOs). The response to the first question, "Has the department developed PLOs?," is unexpected (see *Figures 3.1)*. As a part of program review, all academic programs must report PLOs that align to the ULOs, so it would be reasonable to expect that the answers to this question would indicate a steadily increasing number of programs with objectives. The results seem to indicate the opposite, with the percentage of programs answering "yes," "yes, under revision," and "under development," falling over five years (86% in AY 2010-11 vs. 98% in 2006-07) and the percentage of programs answering "no" steadily rising (14% vs. 2%).[v] These changes might indicate a deeper understanding of PLOs over time. Alignment results, on the other hand, are encouraging (see *Figure 3.2*), with an increasing percentage of programs with PLOs reporting that they are aligned with the ULOs (86% in 2010-11 vs. 34% in 2007-08, the first year the question was asked) and with accreditation standards (50% vs. 30%). The percentages of respondents that publish these objectives in all or some syllabi, in the university catalog, on the department web page, in internal department documents, and on new course/curriculum proposals all peaked in 2008-09 and then decreased, although the percentages for 2010-11 still show an increase over the percentages for 2006-07 (see *Figure 3.3*).

The Academic Senate took action in AY 2010-11 that should address any concerns that these results might raise. In the fall, responding to the WASC recommendation on the alignment and publication of learning objectives/outcomes at all levels, the Senate Chair asked all academic programs to report their objectives and indicate the degree to which each contributes to attainment of the ULOs (see "*Our Polytechnic Identity*," pp. 45-46). In the spring, the senate passed AS-732-11 *Resolution on Posting Program Learning Objectives in the Cal Poly Online Catalog* stating that PLOs should be listed in the *Cal Poly Catalog* along with other program information. The Office of the Registrar quickly implemented this decision the following summer.

In AY 2009-10, in response to the same WASC recommendation, the inventory survey began to include a set of questions on course learning outcomes (CLOs). Because of that year's low response rate, we should only consider the results for 2010-11, when the percentage of respondents stating that their CLOs align with their PLOs was 77%; the percentage requiring CLOs to be stated in their course syllabi was only 40%. The survey also asked respondents to report the percentage of courses with learning outcomes. The results, which are best represented as a distribution across quintiles, are encouraging. In 2010-11, 65% of program respondents said that 80-100% of their courses have outcomes, with nearly half of respondents reporting 100%. College results varied; Architecture, with all but one of its programs externally accredited, had 100% of its programs in the top quintile, while Liberal Arts, with only one of its programs externally accredited, had 75%. Business and Engineering also had percentages in the 70s, while Agriculture and Science and Math had percentages in the 40s. A number of factors may be at work; in the case of Liberal Arts, the results may owe to the college teaching a relatively large number of GE courses with specified outcomes. In the case of Architecture, Business, and Engineering, the results may owe to the external expectations of accreditation agencies as opposed to institutional policies that are somewhat ambiguous on the subject of outcomes. Though many institutional practices essentially require courses to have outcomes—GE courses have their specified outcomes; the new course proposal form requires the listing of CLOs, PLOs, and ULOs as well as corresponding assessment measures; the program review guidelines include the mapping of courses and co-curricular experiences to ULOs—there has been no specific academic policy stating that all

courses must have learning outcomes. At the time of this writing, the Academic Senate is considering the Resolution on Course Learning Outcomes/Objectives, which would address this situation (see "*Our Polytechnic Identity,*" p. 47).

Other Than GPA, What Data/Evidence Is Used to Determine That Graduates Have Achieved Stated Outcomes for the Degree? The response to this inquiry is complicated given the option in the inventory survey of choosing more than one answer, but a simple reordering of results from high to low suggests an appropriate mix of direct and indirect methods of assessment for undergraduate and graduate programs (see *Figure 3.4*).

For undergraduate programs, the senior project has been the most prevalent form of evidence since the inventory began, with 82% of programs using it in AY 2006-07. The use of the senior project has steadily grown to 95% of programs in 2010-11. Student surveys are consistently the second most prevalent form, varying slightly but remaining around 70%. Since 2007-08, the capstone course has been the third and alumni surveys the fourth most used forms. (The senior project is intended to be a capstone experience, but some programs make a distinction between the two.)

The same type of mix is reported for graduate programs. The graduate thesis and graduate project were the two most prevalent forms from AY 2006-07 through 2008-09, when the thesis was the single most prevalent form with 70% of programs using it, followed by the project with 61%. The comprehensive exam became one of the top five assessment forms in 2007-08 with 38% of programs using it; the exam rose to the most used in 2010-11 along with the thesis at 57% each. The only indirect method consistently in the top five is the alumni survey, although its use has declined from 64% in 2006-07 to 39% in 2010-11.

Who Interprets the Evidence? What Is the Process? To understand the response to the first part of this inquiry, a simple reordering of results is once again revealing (see *Figure 3.5*). The results suggest that, from the program perspective, department entities have been more likely to interpret the evidence of student learning than college and university entities. College assessment committees show a pattern of varying involvement (18% in 2010-11, 58% in 2008-09, and 25% in AY 2006-07), as does the university-level Academic Assessment Council, ending in virtual insignificance (1% in 2010-11, 13% in 2008-09, and 11% in AY 2006-07). The results also suggest that assessment has become a more specialized activity in the programs; department chairs have become more involved (76% in AY 2010-11 vs. 63% 2006-07), while entire department faculties have become less involved (61% vs. 71%). Other department entities show a pattern of varying involvement.

To address the inquiry regarding process, the inventory survey asked a question that would seem to be based on the expectations of academic program review: "Has the department developed a plan to assess student learning for all PLOs in one cycle of program review?"[vi] As is typical throughout the survey, responses may not show a clear trend from year to year; in this case, the 2007-08 data appeared to be incomplete. However, the overall direction after five years is positive and consistent: the number of programs answering "yes," "yes, under revision," and "under development," has increased to an overwhelming majority (92% in AY 2010-11 vs. 79% in 2006-07), while the number answering "no," has steadily declined to a small minority (8% vs. 20%). It would be reasonable to expect this number to continue to decline over the normal course of program review if a plan to assess all PLOs in one cycle were an expectation of the process; in fact, the program review template only suggests that the program provide an assessment plan, including "the schedule for assessing each of its learning objectives," as part of the self-study.

How Are the Program Assessment Findings Used? When this question was first asked in AY 2006-07, the largest percentage of respondents was using assessment findings to "stimulate faculty discussion" (70%), followed closely by "improve curriculum" (69%), "examine curriculum content" (67%), and "improve assessment methods" (66%). By 2010-11, there was more talk but even more action: the largest percentage of respondents was using assessment findings to "improve curriculum" (80%), followed by "stimulate faculty discussion" (73%) and "examine curriculum content" (65%); a somewhat smaller percentage was using findings to "improve assessment methods" (61%). The smallest percentage of respondents—by a wide margin—was using findings to "engage students" during all four of the years this answer was an available choice (see *Figure 3.6*). The results of the inventory survey suggest that Cal Poly could strengthen the role of students in the assessment process, as also suggested by the review of program review discussed later in this chapter.

Recommended Action Items

1. **Complete the implementation of the GE Focused Learning Objectives and clarify their relationship to the Educational Objectives and Criteria (p. 32).**

2. **Ensure that campus surveys are well designed and coordinated to promote program improvement and that the results are analyzed and communicated to their intended audiences (31).**
3. **Revise the inventory survey to reflect past experience and current priorities, pretest it thoroughly, and continue to administer it annually (31).**
4. **Revise academic policies to ensure that all courses have current, faculty-approved learning outcomes that are aligned with the program learning objectives and communicated to students (32).**

Program Review in Student Affairs

An institutional commitment to organizational learning and program improvement in Student Affairs dates at least to the establishment of an assessment center in 1994. Although the division eventually devolved assessment responsibility to the units, the center laid the foundation for ongoing, localized efforts that focus on data-driven quality assurance. Today, departments combine direct and indirect methods that can include reflection, focus groups, satisfaction surveys, and the study of population trend shifts.

Summative evaluation once took the form of an annual report that each department submitted to the leadership. In AY 2010-11, following research into best practices at other institutions, Student Affairs launched a comprehensive process of program review based on the self-assessment standards and guidelines produced by the *Council for the Advancement of Standards* and used by student development practitioners at colleges and universities across the country. The division has addressed internal expectations by aligning the council's standards with the ULOs (*Appendix 3.1*). All departments have also aligned their program learning objectives to the ULOs.

Following the council's standards and guidelines, each department develops a report that includes an assessment plan. A team of reviewers, which consists of external experts and Cal Poly student, faculty, and/or staff representatives external to Student Affairs, examines the department's structure, functions, and program assessment data and produces a report that addresses the alignment of student learning objectives with program and service delivery. The entire process lasts one year, with all departments reviewed on a five-year cycle. By Fall 2011, three departments—*Career Services*, *Testing Services*, and *Student Life and Leadership*—had completed program reviews and shared their results at a division retreat on strategic planning. Three more departments are undergoing review in AY 2011-12: *Counseling*, *Health Services*, and *Student Academic Services*. The remainder of the schedule is under development.

Because comprehensive program review is relatively new to Student Affairs, the process itself has not yet undergone review, but it has already led to improvements. Among the departments in the first cohort, Student Life and Leadership has restructured several programs and services to better meet the needs of students. For example, the department has reassigned space to create a private office for the *Safer* program, which aims to reduce sexual assault and relationship violence on campus. Career Services is forging enhanced relationships with academic and industry partners to improve student learning and workplace preparation in diverse fields. Finally, Testing Services is considering entrepreneurial opportunities that might both provide financial support for the department and enhance service to the local community. These services may include offering certification and qualification exams for crafts and trades; credential exams, e.g., the California Basic Educational Skills Test; undergraduate and graduate entrance exams, e.g., SAT and GMAT; and exams for online learning programs at other universities.

Both Student Affairs and Academic Affairs might benefit from a more comparative and collaborative approach to program review. In coming months, the two divisions along with the Center for Teaching and Learning will develop staff-oriented workshops that explore the connection between program review and strategic planning. The workshops will focus on aligning learning outcomes, redefining educational effectiveness indicators, and developing strategic collaborations that support the three focal points of Student Affairs: a residential campus, Inclusive Excellence, and modeling whole-system thinking.

Recommended Action Items

5. **Develop a comprehensive schedule for program review in Student Affairs (p. 33).**
6. **Evaluate the program review process in Student Affairs after all departments have undergone review (p. 33).**
    - Apply the WASC Rubric for Assessing the Integration of Student Learning Assessment into Program Reviews to provide a basis for aligning program review across divisions.

- Compare the review processes in Student Affairs and Academic Affairs to discover what the two divisions can learn from each other regarding program improvement and possible integration of the review processes.

Program Review in Academic Affairs

At Cal Poly, program review dates back to 1992, when the Academic Senate adopted a model in the wake of painful budget cuts that had led to a process of program evaluation and elimination.[vii] The 1992 model emphasized data collection on a six-year cycle with programs preparing information packages for consideration by a senate committee of tenured full professors. This program review committee then conducted audit-style evaluations and submitted an annual report consisting of general recommendations and individual program summaries.[viii] The senate frequently revised the 1992 model, causing "a duplication of processes and inefficient use of resources."[ix] The most important changes came in AY 1995-96, when the senate decided that "all degree programs … will seek either specialized accreditation or undergo external review" and that accreditation or external review would take place one year before internal review. [x]

The current model of academic program review dates to 1999, when the provost at that time established the Task Force on Institutional Accountability and Learning Assessment. Its charge was "to propose a systematic and coordinated approach to addressing academic (and larger institutional) accountability and assessment issues" in a manner consistent with Cal Poly's mission and values. The task force produced two reports that proved to be formative: one on "Learning Assessment" and the other on "Institutional Accountability." The latter proposed a new model of program review that the senate adopted in 2000.[xi]

In contrast to the compliance-oriented process of 1992, the 2000 model emphasized program improvement and increased efficiency. It retained the six-year cycle while featuring a focused, faculty-defined self-study; simultaneous internal and external reviews (peer or accreditation) with a site visit for all programs; a faculty-developed action plan; and a specified role for the college dean that had been lacking in the 1992 model—a fact not lost on the 2000 WASC visiting team.[xii] Under the old model, the program review committee had reported to the Academic Senate Executive Committee, which reported to the president. Under the new model, program review became a process involving the program, the college, and Academic Programs, with the senate's role reduced to consultation and approval of internal reviewers by the executive committee. A measure of the new model's success is the degree to which it has not attracted the attention of the senate, which until recently had not taken any further action on program review.

Program Review Today

The basic features of the 2000 model still form the foundation of program review as it is practiced today. It operates on a six-year cycle with five stages: preparation, self-study, peer review, action plan development, and action plan implementation. Oversight of the process remains with Academic Programs and Planning. All phases of program review are documented on the *Program Review web site*.

The guidelines call for faculty participation in the development and implementation of the self-study and action plan. To promote faculty engagement, the guidelines allow the adoption of a program-specific self-study theme. This option allows the faculty to focus on a challenge of significance to the program in addition to responding to the institutional theme and any CSU requirements. The current institutional theme is the senior project as a capstone experience and an artifact of student learning (see "*Student Learning*," pp. 18-20). Past examples of institutional themes have included student learning and assessing retention and graduation rates. These continue to be focus areas in the guidelines.

The department chair coordinates faculty efforts and acts as the program liaison to the dean's office. The associate dean coordinates college-wide efforts, generally acts as the college liaison to Programs and Planning, meets with the review team during the site visit, and handles other responsibilities as delegated by the dean. Typically the dean approves the peer-review nominees, program-specific theme, and action plans, in addition to meeting with the review team during the site visit.

The guidelines allow for concurrent review of undergraduate and graduate programs within the same department. In this case, one of the peer review team members must have expertise in graduate programs, and the self-study must address all the required elements for both programs. The guidelines also allow externally accredited programs to conduct their internal and accreditation reviews concurrently if permitted by their accrediting agencies. The accrediting agencies determine the external review team, and programs nominate internal reviewers. Programs work with their dean's office to

identify and map which internal program review requirements are met by accreditation standards and which are not. Following this analysis, programs submit a formal proposal on the scope of the internal program review. Programs with accreditation cycles lasting eight years or longer must undergo an additional mid-period internal review.

Following receipt of the review team's report, programs draft an *action plan* based on both their own and the team's recommendations for improvement. The dean and vice provost approve the plan following a meeting with the faculty. Each fall, programs submit an action plan to Academic Programs and Planning that includes any changes in context or assumptions; new obstacles and challenges; tasks completed, pending, deferred, rescheduled, or reassigned; and any additional resources needed. The dean's office aggregates the progress reports and sends a summary to the provost and Programs and Planning. In the past, programs have not always referred to or updated their action plans regularly, but Programs and Planning hopes the annual reporting instituted in the 2010-12 guidelines will make the action plan a true engine of continuous improvement.

Kaizen. In April 2010, an associate professor in Industrial Technology facilitated an improvement exercise known in Japanese as *kaizen*.[xiii] This exercise brought together representatives from various campus constituencies to analyze the process of program review, identify problems, and brainstorm solutions. As a result of the group's efforts, Programs and Planning revised the review guidelines to reflect the following changes:

- Starting in Spring 2010, the vice provost leads college-wide orientation meetings for all programs starting review in fall quarter.
- During fall quarter, the vice provost and each dean or associate dean approve all reviewer nominations and proposals for program-specific themes.
- Each program completes annual action plan progress reports during years three through six of the review cycle, which correspond to the implementation stage; the vice provost and associate dean provide feedback to the department chair/head.
- Each program also conducts annual assessments during years three through six of the review cycle.

The 2000 model of program review had called for final approval of internal reviewers by the Academic Senate Executive Committee. The kaizen group found this requirement to be an unnecessary source of delay that did not add value to the process because the reviewers were already "selected and vetted by the program faculty and endorsed by the college deans and the vice provost."[xiv] Accordingly, in October 2010, the senate approved AS-718-10 *Resolution on Modification to Academic Program Review Procedures* that removed the executive committee as the final approving body for internal reviewers and required that Programs and Planning provide an annual summary of program review findings to the senate, including a list of internal reviewers. At the end of the 2010-2012 review cycle, in an attempt to determine the efficacy of these changes, Programs and Planning will seek feedback in the form of surveys or focus groups from programs that will have completed review under the revised process.

Reviewing Academic Program Review

The EER review of academic program review was intended to model a comparative, synthetic approach to the results of program review. The project's original goal was to read the documents from an entire two-year cohort of programs undergoing review, but no single cohort sufficiently represented all the colleges. For the purpose of generating a diverse sample for the self-study, then, Programs and Planning selected a collection of twenty-three programs from three cohorts: 2006-2008, 2007-2009, and 2008-2010. When examining their documents, working group members had access to varying levels of information. For non-accredited and some accredited programs, members reviewed evidence covering the entire scope of the review process: self-studies, internal and external reviewer reports, and action plans. Due to the requirements of the accrediting bodies for the Colleges of Engineering and Business as well as the resulting length of their self-studies, members examined only selections from those documents.

Because of the size and complexity of the review, the leaders of the self-study adopted a process of upward-building conclusions:

- Each individual member of the working groups read one set of program review documents and wrote a statement of findings.

- After a discussion of the individual statements by the working group, each chair wrote a summary of the group's findings.
- After a discussion of the working group summaries, the chairs met with the Accreditation Liaison Officer, the Faculty Director of the Self-Study, and the Vice Provost for Programs and Planning and applied the *WASC Rubric for Assessing the Integration of Student Learning Assessment into Program Reviews*.

The workings groups used two lenses for this examination, one provided by the self-study and the other by WASC. Each group read the program review documents for evidence that might help answer the thematic questions posed in the self-study's original proposal. Each group also considered how the process evident in the documents compared to WASC expectations for program review: outcomes-based assessment of student learning and development, evidence-based claims and decision-making, and the use of program review results to inform planning and budgeting. One chair developed a rudimentary scoring system based on degrees of evidence (0 = no evidence, 1 = some evidence, and 2 = clear evidence), which allowed individual program and working group results to be compared and aggregated.

Results. In the case of one working group, there was some confusion about the application of the two lenses, with working group members looking for evidence that thematic concerns were addressed in each area of program review rather than considering thematic questions separately from WASC expectations. This shift in focus might have implied a more stringent standard for that group, but, in fact, there was a surprising consistency in the results, with a few variations described below.

- **Theme-based questions and evidence.** This was the lowest ranked criterion, with an overall average of 0.9, slightly less than "some evidence," and group results varying from a high of 1.8 for the Integration and Student Learning Working Group to lows of 0.4 and 0.5 for the Learn by Doing and Teacher-Scholar Model Working Groups respectively. The results apparently depended on the kind of inquiry: the self-study questions for Integration and Student Learning address issues that the program review guidelines also address, but the Learn by Doing and Teacher-Scholar Model questions are more narrowly focused on thematic issues that the guidelines do not address, such as the impact of Learn by Doing on diversity. In keeping with this trend, academic success for under-represented students was the one thematic area for which Integration and Student Learning did not find clear, direct evidence, and it is not covered by the guidelines. Learn by Doing could answer its questions inferentially**,** which is not surprising given the pedagogy's historical importance at Cal Poly, but Teacher-Scholar Model found little evidence of scholarly activities and their relationship to student learning.
- **Outcomes-based assessment of student learning and development.** This was the highest ranked criterion, with an average score of 1.97 suggesting clear evidence of outcomes-based assessment of some kind and at some level in the reviewed programs**.** This finding is consistent with the expectations of program review, as explicitly stated in the guidelines and template.
- **Evidence-based claims and decision-making.** This was the second highest ranked criterion, with an average score of 1.80 indicating clear demonstration of evidence-based claims and decision-making in most reviewed programs. This result is consistent with the expectations of program review.
- **Use of program review results to inform planning and budgeting.** This was the third highest ranked criterion, with an average score of 1.67 suggesting some to clear evidence of the use of results in reviewed programs, mostly to improve curriculum. One group noted that evidence for this criterion was found "in a section reporting on actions taken on action items from the previous program review" and that "items that required time and/or money or space were most often not acted upon."

Based on these results, the leaders of the self-study applied the WASC rubric on program review, a four-point rubric with1 being initial and 4 being highly developed, and came to the following conclusions in each of the five dimensions:

- **Required elements of the self-study.** In this dimension, the process of program review at Cal Poly is at a developed stage. To quote the rubric, "Each faculty, as a part of its self-study, is required to provide the program's student learning outcomes." According to the program review template, each faculty is also supposed to give an overview of its assessment plan, including the schedule, responsibilities, and process of using results. Whether this expectation applies to the previous or upcoming cycle of assessment is not clear, and the program reports tend to be backward- rather than forward-looking.

- **Process of review.** Program review is at a highly developed stage. "A well-qualified team of internal and external reviewers evaluates the program's learning outcomes." The team gives feedback and makes suggestions for improvement based on a certain amount of formal guidance provided in the guidelines and informal guidance provided at the entrance meeting. The faculty is supposed to develop a multi-year action plan based on the team's recommendations and the self-study's action items, but the plan may actually be more the work of the department head or program leader.
- **Planning and budgeting.** Program review is at a stage between developed and highly developed. Reports show little evidence of forward, strategic, or visionary thinking. The campus does integrate program review into planning and budgeting during the action plan development stage, although the action plan tends to describe only what the faculty intend to do; administrative decisions are taken more informally.
- **Annual feedback on assessment efforts.** In this dimension, program review is at an emerging stage. During the course of review, programs may receive feedback on the quality of outcomes, etc., but the response is not regular and predictable. Other than completing a WASC-compliant survey, programs do not yet report annually as required by the guidelines, making it difficult to give regular feedback.
- **The student experience.** Program review is at a stage between emerging and developed. Reviewers do engage students in conversation and examine samples of student work, but students are not necessarily invited to discuss what they have learned.

At 3.0, the overall average of these rubric-based results suggests that program review in Academic Affairs is at a developed stage as defined by the WASC rubric, which focuses on student learning. However, neither the rubric nor the process of program review explicitly addresses the issue of student development as it is understood by student development professionals, although the template does include related topics under the heading of student success. The typical academic program, if asked, would probably not know how to address the issue; even Student Affairs is at an early stage in coming to terms with its implications, as is WASC. Nevertheless, a truly integrated approach to program review would employ a form of whole-student thinking that brings together the professional concerns of the two divisions and overcomes the university's tendency to compartmentalize the challenges of student development, engagement, learning, and success along the lines of its administrative units.

When the leaders of the self-study met to discuss the summaries and apply the rubric, the Vice Provost for Programs and Planning was so enthusiastic about the results that he suggested enlarging the process to include the associate deans, who manage learning assessment and program review in their colleges. They subsequently met to share their experiences, apply the WASC rubric, and make their own recommendations. The associate deans employed a somewhat different rubric process, providing individual scores based on their college experiences, which were aggregated to produce campus-level results. They came to the following conclusions:

- **Required elements of the self-study.** In this dimension, the colleges were clustered around emerging with an average of 2.3 and one more developed outlier (see *Figure 3.7* for college results in all dimensions). This result was based on a divergence between what is required by the guidelines and what programs actually provide in the course of review. Accredited programs may have trouble navigating between the guidelines and the requirements of the accrediting body. Non-accredited programs may lack the expertise to define, present, or interpret the assessment data in useful ways. There is little to no planning for the next assessment cycle.
- **Process of review.** The college average was 3.0, which corresponds to developed. Reviewers do not always evaluate the program's learning outcomes, etc., because, as indicated in the previous dimension, programs do not always provide the required elements. Furthermore, the university does not provide the reviewers with any detailed guidance in responding to the self-study, e.g., asking them to apply the WASC program review rubric. There is little to no benchmarking of results.
- **Planning and budgeting.** The scores depended somewhat on the context. If thinking about the campus, as the rubric is written, the associate deans all agreed that program review is very much at the initial stage in this dimension. If thinking about their colleges, the results varied widely: two of the associate deans judged program review to be at the initial stage, two at the initial-to-emerging stage, one at the emerging stage, and one at the emerging-to-developed stage, with an average among all the colleges of 1.4. It was suggested by way of explanation that colleges with more centralized budgets may have more success in linking assessment results to planning and budgeting decisions.

- **Annual feedback on assessment efforts.** The college average was 2.5, emerging to developed, with three colleges at emerging and three distributed between emerging and highly developed. Reviewers do provide occasional feedback on the quality of outcomes, etc. Other than completing a WASC-compliant survey, programs do not yet report annually, although this is required by the new guidelines, and they do not receive annual feedback.
- **The student experience.** The scores clustered around developed with an average of 2.7 and one less developed outlier. Reviewers do examine student work. They do meet with students although they do not necessarily discuss student learning. With one exception, the associate deans felt that it would be too much to claim that students are considered "respected partners" in the review process.

Giving an overall average score of 2.4, the associate deans considered program review to be at a somewhat less developed stage than the leaders of the self-study. Between the two sets of evaluators, however, there was a divergence of more than 1 in just one dimension—planning and budgeting. The associate deans interpreted this difference as a reflection of their own closeness to the realities of planning and budgeting in their colleges, in contrast to the leaders of the self-study, who may have been more influenced by a central-administration perspective.

Interestingly, when asked to rate the development of program review in a more holistic fashion, using a dimension of the WASC Educational Effectiveness Framework, the associate deans all agreed that the process at Cal Poly has reached a developed stage. To paraphrase the framework, they would all say that program review is frequent, affecting all curricular units, with growing inclusion of findings about student learning. The units use the findings to improve the effectiveness of their programs, especially in the area of curriculum. However, they would also say that there is insufficient linkage between program review and institutional-level planning and budgeting.

Using the same document, the leaders of the self-study concluded that program review is at a somewhat less than developed stage but still closer to developed than emerging. They cited the persistent conflict between internal and external expectations for review, the programs' uneven use of learning objectives/outcomes, the inconsistent implementation of action plans, and numerous possible improvements indicated in the action items proposed below.

Additional Issues to Consider

A few issues of possible significance arose multiple times during discussions of program review, the first of which was the relationship between internal and external expectations for the review of accredited programs. The current guidelines specify a process that maps the Cal Poly requirements to those of the accrediting body, followed by a formal proposal to the dean and vice provost regarding the scope of program review. The process as described is rigorous, but it has not yet been put into effect, which means that the expectations of the accrediting body may trump those of the university and that the internal process of quality assurance may depend on the rigor of an external one.

Another topic that yielded a good deal of discussion is whether each major program is responsible for ensuring student attainment of the ULOs, wherever that happens—in GE or the major, in the curriculum or co-curriculum. Though the major does not control all these areas, it is arguably best placed to monitor ULO attainment because students are connected to their majors throughout their entire Cal Poly careers.

A final issue regards alignment and publication of learning objectives. As described above, programs undergoing review are supposed to map PLOs to ULOs, courses to PLOs, and courses and co-curricular experiences to ULOs. Programs are not expected to align or publish CLOs, but WASC has recommended that we align and publish objectives/outcomes at all levels. Discussion revolved around how program review can respond to this recommendation by asking programs to submit updated course information that includes aligned CLOs.

Recommended Action Items

7. **Clarify the responsibility of academic programs for assessing student attainment of all PLOs during a single program review cycle and revise the program review guidelines accordingly (p. 32).**
8. **Over time, find ways to address the themes of the university's self-study more directly in program review (36).**
    - Ask programs to respond to the new senate-approved definitions of Learn by Doing and the teacher-scholar model.
    - Ensure that all programs undergoing review provide clear, direct, non-anecdotal evidence regarding the level of academic success for under-represented students.

9. **Find ways to make the process of program review both more summative and more forward-looking (36-37).**
    - The self-study template should conclude with a synthetic section that encourages programs to summarize lessons learned and describe aspirations for the future.
    - The action plan should include a formative section that moves the program toward the aspirations described in the self-study.
10. **Formalize and strengthen the connection between academic planning, resources, and program review (37).**
    - Action plans tend to be statements of intent by the faculty. The final step in program review should be to memorialize an understanding between the faculty, the dean, and the provost within the context of strategic planning.
11. **Consider ways to strengthen the role of students in the assessment process and make them "respected partners" in the process of academic program review as suggested by the WASC rubric on program review; revise the guidelines accordingly (37, 38).**
12. **Improve feedback to the programs and the university (37, 38).**
    - Implement annual action plan reporting by the programs, as required by the guidelines, with the expectation that there will be written responses from the deans.
    - Clarify the relationship between the annual action plan reporting and the annual assessment of student learning, both of which are expectations of the guidelines.
    - Organize an annual focus group of program leaders who have completed program review; the results should help to improve the process.
13. **Provide better support for program review through appropriate means, including the Center for Teaching and Learning (p. 37).**
    - Continue to provide workshops on the assessment of student engagement, learning, and success.
    - Explore the possibility of providing a workshop on student development.
    - Initiate a professional learning community for leaders of programs undergoing review.
14. **Provide more detailed guidance to reviewers on WASC, university, college, and program expectations. They should expect that program self-studies take the form of not only an inventory but also an inquiry (37).**
15. **Ensure that accredited academic programs satisfy both the external expectations of accreditation and the internal expectations of program review by implementing the process described in the guidelines (p. 38).**
16. **Clarify the responsibility of academic programs for ensuring student attainment of the ULOs and revise the program review guidelines accordingly (38).**
    - Programs should assess the extent to which required major courses contribute to ULO attainment and make improvements based on the results.
    - Programs should map all required courses and co-curricular experiences to the ULOs, evaluate the ability of a student's whole education—in GE and the major, in the curriculum and the co-curriculum—to promote ULO attainment, and work with other programs and departments to make improvements based on the results.
17. **Use the program review process to ensure that learning objectives/outcomes are aligned and published at all levels and that course information is current and accurate (38).**
    - Self-studies should include revised course outlines, syllabi, and/or proposals. Programs can use these documents to inform students, staff, and faculty; the registrar can use them to update catalog information. An alternative would be to build this kind of review into the curriculum cycle by establishing a sunset date for all courses.

Our Polytechnic Identity

The institutional proposal's overarching theme, Our Polytechnic Identity, sparked a visionary, aspirational conversation during CPR. This conversation influenced Cal Poly's strategic planning but, because of its aspirational nature, did not yield substantive measures of educational effectiveness. Consequently during EER, the leaders of the self-study chose to consider institutional identity through the lens of the three remaining themes, each of which is an essential aspect of that identity. Learn by Doing presents our signature pedagogy as an integrating concept in which all units and disciplines may be reflected. The Teacher-Scholar Model considers the transition between Cal Poly's historically teaching-focused mission and the institution's growing emphasis on scholarly activity. Integration and Student Learning examines how the university might intentionally connect disparate educational experiences by concentrating on the whole student rather than dividing student learning along bureaucratic lines. The ways in which the institution continues to grow and mature in these areas will define our comprehensive polytechnic identity in the twenty-first century.

As a whole, this chapter considers aspects of WASC Standard 2, Achieving Educational Objectives Through Core Functions, and Standard 3, Developing and Applying Resources and Organizational Structures to Ensure Sustainability. The Learn by Doing section investigates the university's shared understanding of this form of active learning (CFR 2.5), its educational effectiveness (2.4, 2.6), and its impact on student recruitment and retention (2.10). The Teacher-Scholar Model section addresses the value of scholarship (2.8), its link to teaching and student learning (2.9), and the adequacy of information resources (3.6), as well as staff and faculty evaluation and development (3.3, 3.4). The Integration and Student Learning section examines the alignment and publication of learning objectives/outcomes at all levels (2.3), the effectiveness of the senior project as the capstone to an integrated course of study (2.2a), and the impact of the institution's organizational structures (3.8).

Learn by Doing

Though Cal Poly's commitment to Learn by Doing has been unwavering since the university's establishment in 1901, there has been little attempt to define what the university does differently or better than its peer institutions. On the contrary, there is a longstanding, deeply entrenched assumption that the meaning and effectiveness of Learn by Doing are self-evident. This assumption does not account for the complexity of this signature pedagogy as the university has come to understand it.

CPR Action Item: Establish a Working Definition of Learn by Doing. At the beginning of the CPR process, the Learn by Doing Working Group concluded that its primary task must be to define Learn by Doing in a way that was both inclusive and meaningful for all constituencies. To accomplish this goal, the working group collaborated with members of the Academic Senate to produce a single, working definition of Cal Poly's signature pedagogy that was expansive enough to account for the myriad ways and places in which student learning occurs yet precise enough to be useful in assessing the educational effectiveness of specific practices. The result of these efforts was AS-727-11 *Resolution on a Working Definition of Learn by Doing*, which states that, "At Cal Poly, Learn by Doing is a deliberate process whereby students, from day one, acquire knowledge and skills through active engagement and self-reflection inside the classroom and beyond it." This formulation acknowledges the fact that the process has deep roots in the university's curriculum and its co-curriculum.

The senate and the working group offered this definition to the campus not as the last word on Learn by Doing but rather as a benchmark indicating where the university sees itself at this particular moment and as a reaffirmation of a shared history that continues to shape the institution's identity. The multiple explanations of Learn by Doing found on the websites of various units all demonstrate that the university still has many ways of understanding and implementing this shared philosophy of learning. The definition's intent is to validate and celebrate the ways in which Learn by Doing cuts across institutional and disciplinary boundaries to help form a cohesive, integrated academic community. At the same time, the senate and the working group hope the definition will encourage both internal and external stakeholders to be more intentional and reflective about the discussion, implementation, and evaluation of Learn by Doing.

WASC Recommendation: Demonstrate the Educational Effectiveness of Learn by Doing. Following the CPR site visit in February 2010, the WASC Visiting Team found that "Learn by Doing is a clearly established and successful practice at Cal Poly" but also urged the university "to develop measurable ways of demonstrating the educational effectiveness of this practice."[i] The senate-approved definition of Learn by Doing is intended to assist all campus

constituencies in assessing the impact of Cal Poly's signature pedagogy by breaking down the practice into measurable units of analysis. By focusing more intently on the "deliberate" nature of the university's ongoing, "from day one" commitment to Learn by Doing and by evaluating the efficacy of specific types of "active engagement" and "self-reflection" for acquiring essential "knowledge and skills," all programs may be able to demonstrate what is genuinely unique about the university: the extent to which Learn by Doing not only integrates curricular and co-curricular activities but also distinguishes one program or activity from another. If Cal Poly is to continue staking its institutional identity on the centrality of Learn by Doing, however, it needs to clarify why and how one version of the pedagogy is more effective than another rather than assume that the link between Learn by Doing and student learning/success is obvious. To this end, the working group started to develop a rubric based on the definition as broken down above.

In another effort to measure the success of Learn by Doing at Cal Poly, working group members examined a selection of program review documents from all six colleges. While members found evidence of many practices typical of Learn by Doing, they concluded that the university could strengthen its signature pedagogy by developing a process that explicitly connects Learn by Doing with program learning objectives (PLOs) and by extension with planning and budgeting. Extensive references to the role of Learn by Doing in student attainment of specific PLOs underscored the fact that the pedagogy is an integral and highly effective component of all eight of the programs whose documents were examined. In addition, all of the programs used some form of direct and indirect assessment of Learn by Doing to evaluate and revise PLOs, curricular offerings, and assessment practices, but only one of the eight programs explicitly made the connection between Learn by Doing and planning and budgeting. This finding is surprising given longstanding concerns about the pedagogy's high cost.

The results of multiple surveys point to the senior project as a promising source for assessing the impact of Learn by Doing on student achievement of PLOs. According to the EER Program Survey, all undergraduate programs require a senior project of their students, and 93% of programs expect that, upon completion of this activity, most graduates will demonstrate a high level of disciplinary expertise (see *Appendix 1.4*). Moreover, 56% of senior respondents to the *CPR Student Survey* reported that the senior project was one area where Learn by Doing experiences most often take place, second only to courses in the major. In the EER Student Survey, when asked how much their senior projects emphasized "applying theories or concepts to practical problems or in new situations"—a hallmark of Learn by Doing—78% of respondents replied "quite a bit" or "very much"; 60% said the same when asked how much their projects provided them with opportunities to see how or what they were learning works in different settings, both on and off campus (see *Appendix 1.5*). These results suggest that the culminating experience helps students to experience firsthand how their education applies in real-life situations—another common understanding of Learn by Doing.

From these results, it seems likely that the senior project would be a useful, Learn by Doing activity for assessing student attainment of most PLOs and for clearly demonstrating the educational effectiveness of Cal Poly's signature pedagogy. On the 2010-11 Inventory of Educational Effectiveness Indicators, 95% of undergraduate programs reported using the senior project to demonstrate that graduates have achieved some PLOs, which suggests that programs are de facto assessing the educational effectiveness of Learn by Doing; they simply need to be more intentional in demonstrating how this pedagogy contributes to PLO achievement (see "*Organizational Learning*," pp. 11-20).

Another measure of the effectiveness of Learn by Doing is its possible contribution to the initial and enduring success of Cal Poly's graduates. Employer and alumni surveys conducted by Career Services and by individual programs like Environmental Engineering all suggest that many graduates enjoy a competitive advantage upon entering the job market. Recent news reports specifically reference the superiority of the university's practical, Learn by Doing experiences and suggest that the benefits of these experiences persist well into a person's career. When compared to graduates of almost all other public universities in California and to those of many private institutions, Cal Poly graduates on average post higher mid-career salaries than their peers.[ii] This evidence is encouraging, but it would make sense to pursue more systematic, longitudinal studies of particular student cohorts to provide more conclusive evidence of such success.

How can Learn by Doing be leveraged to assist in the recruitment and retention of students, especially those from underrepresented populations? In the CPR Student Survey, over half of the respondents indicated that the Learn by Doing model influenced their decision to apply to Cal Poly, and over two-thirds indicated that Learn by Doing experiences have met their expectations. In Spring 2009, students in BUS 418 Listening to the Customer designed and conducted their own surveys of Learn by Doing's effectiveness and concluded that the pedagogy does give Cal Poly a comparative advantage over its peers in retaining current students. The students in BUS 418 also recommended that Cal

Poly adopt a more intentional branding initiative to inform prospective students about what, precisely, is meant by Learn by Doing. In 2010, the university adopted such a branding initiative, which has focused on presenting narratives about Learn by Doing both on the university's website and in other communications to prospective students. Though the brand's appeal to various internal and external stakeholders was tested during the initiative's development process, no demographic data was collected. The university has not yet performed any assessment on whether the initiative has increased the number of applicants from under-represented populations.

Scholarly evidence suggests that some Learn by Doing practices that are considered high impact—e.g., first-year seminars, learning communities, and service learning experiences—may play an important role in recruiting and retaining under-represented students. For example, African-American students engaged in higher levels of these practices are more likely to return for their sophomore year than their white counterparts.[iii] Cal Poly students, staff, and faculty have an excellent opportunity to test such conclusions firsthand. For example, joint research projects could see how Learn by Doing contributes to the achievement of participants in the *Partners Program*, which assists under-represented students in their adjustment to university life. Cal Poly also has numerous programs in STEM-related fields where women in particular are historically under-represented. The university should leverage its strength in these fields and in Learn by Doing through programs such as the CESAME *Learn by Doing Lab* for middle-school children, which is sponsored by the Center for Excellence in Science and Math Education, and *Fourth Grade Engineering Days*, sponsored by the Society for Women Engineers, to contribute to a growing body of literature that seeks to maximize women's success in these fields.

Recommended Action Items

1. **Continue to assess the educational effectiveness of Learn by Doing practices across campus by developing and implementing a university-wide rubric based on the working definition (41).**
2. **Encourage an explicit emphasis in program review on the connections between Learn by Doing, PLOs, planning, and budgeting (41).**
3. **Use Learn by Doing practices, perhaps through joint student, staff, and faculty research projects to:**
    - Assess the long-term career and personal benefits of Learn by Doing by means of systematic, longitudinal studies of specific student cohorts (41).
    - Investigate and develop Learn by Doing's potential for recruiting and retaining students, staff, faculty, and administrators from under-represented groups (42).

Teacher-Scholar Model

Cal Poly has traditionally been a primarily undergraduate, teaching-oriented institution, but, over the last thirty years, scholarship has taken on a role of greater importance. Because this shift happened gradually, the university had not until recently formulated an appropriate policy on the teacher-scholar model, even though the CPR report found that a substantial proportion of the faculty appears to be engaged in research, scholarship, and creative activity (RSCA).[iv] During EER, the Teacher-Scholar Model Working Group focused on developing such a policy, which was one of the original ambitions of the self-study.

WASC Recommendation: Clarify the Definition of the Teacher-Scholar Model. Until recently, the implementation of the teacher-scholar model at Cal Poly had been hampered by the lack of both a comprehensive understanding of scholarship and an accepted working definition of the teacher-scholar. In Fall 2010, the Academic Senate formed a task force comprised of members from both the senate and the working group and charged it with developing a statement that addressed these two needs. The task force wanted to facilitate student learning by strengthening the nexus between teaching and scholarship without putting unreasonable demands on the faculty, given the resource constraints and the challenges of a high teaching load at Cal Poly. In order to achieve this goal, AS-725-11 *Resolution on Defining and Adopting the Teacher-Scholar Model* endorsed both Boyer's broad definition of scholarship and his characterization of the teacher-scholar. The result is a flexible version of the model that encompasses the scholarship of discovery, application, teaching/learning, and integration in a discipline-specific manner; allows individuals to find their own balance between teaching and RSCA; and enhances learning through "student engagement in faculty scholarly activity and inclusion of scholarship in teaching."

WASC Recommendation: Establish Plan of Targets to be Accomplished by EER and Beyond. In Fall 2011, President Armstrong selected "embrace the teacher-scholar model" as one of six strategic imperatives derived from Cal

Poly's *Strategic Planning*. The president also included among the targeted indicators of progress several that may guide the model's implementation: faculty-student research and creative activities, student-faculty ratio, ratio of tenured/tenure-track to non-tenured/tenure-track faculty, endowed programs and chairs, and nationally recognized scholars. More direct indicators will be developed during AY 2011-12 following a process of campus consultation. Once the institution sets targets for these indicators, Programs and Planning will assess progress toward their achievement.

CPR Action Item: Track Scholarship More Effectively. In order to effectively assess Cal Poly's progress in embracing the teacher-scholar model, the university will need a more robust system of tracking RSCA. Faculty members engage in an average level of RSCA in comparison to those on other CSU campuses, as indicated by grant and contract activities.[v] By this metric, scholarly activities at Cal Poly have increased in recent decades, and the university is among the top campuses in the CSU for allocating grant money to students participating in undergraduate research. However, the university has not quantified the full realm of RSCA because these activities are not consistently tracked, with the exception of those that are externally funded.

The CPR report identified Digital Measures as a possible tool for tracking RSCA more effectively. The Orfalea College of Business currently uses Digital Measures to summarize faculty professional development information in response to the expectations of the college's accreditor. Academic Personnel investigated using Digital Measures to conduct an electronic version of the existing retention, promotion, and tenure (RPT) process, a practice that would likely produce the most complete record of RSCA. After extensive review, however, the office found that neither Digital Measures nor two other commercial tools could address the complexities of the process in the CSU. However, Academic Personnel and Information Technology Services are working toward an electronic workflow solution that they hope to have in place by Fall 2012. The Academic Senate has endorsed a pilot to be run in one college.

Another possible vehicle for tracking RSCA is the program review process. Though evidence presented in the CPR report demonstrated that programs are implementing the teacher-scholar model, the working group found mostly anecdotal evidence of RSCA during the review of program review, and this evidence was rarely examined with the rigor devoted to other areas. Most programs did not have explicit standards for RSCA, though a majority provided a range of acceptable activities as well as some specific examples. Several programs related instances of student involvement in faculty RSCA, but the self-studies uniformly lacked both the quantification of RSCA at the program level and the assessment of student learning resulting from involvement in faculty RSCA. Of the program reviews that explicitly addressed teacher-scholar issues, all expressed similar impediments to fully implementing the model: time available for RSCA due to heavy teaching loads and funding for infrastructure to support RSCA.

In all fairness, the previous program review guidelines did not specifically ask about RSCA. The current guidelines do request a summary of the whole faculty's scholarship but not program-level quantification of faculty RSCA or an account of student involvement in those activities. The working group reached the consensus that programs would be likely to present more evidence of RSCA and its importance to student learning if explicitly requested to do so during program review. For example, the guidelines could encourage programs to provide evidence of student participation in faculty RSCA, as is currently required of faculty members undergoing tenure review in the College of Science and Math.[vi]

CPR Action Item: Provide the Library With Appropriate Resources. Reliable, timely access to scholarly and professional information is fundamental to the ability of students and faculty to engage in their own RSCA efficiently and effectively, but Kennedy Library's collections have not kept pace with publisher price increases or with expanded activity across all disciplines. There is a marked disparity in funding for library resources at Cal Poly compared with both CSU- and non-CSU peer institutions, and the buying power of the library budget has been eroded further as publisher costs have continued to inflate each year (see *Appendix 4.1*). In the short term, improved access to scholarly and professional information can best be addressed by channeling new funds to protect and expand access to these resources. A longer-term strategy is for Cal Poly to sustain its investment in *DigitalCommons@CalPoly*, joining other universities in supporting open access to scholarly work.

Digital Commons is an online archive of Cal Poly student and faculty scholarship. Launched in 2008 by the Kennedy Library, the archive is among the nation's most successful university institutional repositories, with over 12,000 documents and over a million downloads as of September 2011. As a centralized, convenient platform for students and faculty to share their work with the world, Digital Commons promotes discovery, research, collaboration, and instruction across all units; it also showcases Cal Poly's RSCA to prospective students and potential collaborators at other

institutions. The archive helps faculty members to maintain an active, stable digital presence for their work while giving them confidential reports on the number of downloads per document—an indicator of scholarly impact and influence.

Because the content of Digital Commons depends on voluntary participation by students and faculty and because author-publisher copyright agreements prevent many faculty members from providing open access to their work, the archive is not an entirely appropriate venue for formally monitoring scholarly productivity. However, most documents added to Digital Commons have gone through peer review via disciplinary journals or, in the case of student research, vetting by faculty members. Much of the content therefore meets the established standards for scholarly rigor.

Promoting greater participation in Digital Commons would further increase its value to Cal Poly student and faculty scholars, facilitating more cross-disciplinary work and showcasing the quality of Cal Poly RSCA. In 2008, Research and Graduate Programs began requiring online submission of master's theses for inclusion in the repository. In 2009, the library implemented an electronic submission process for senior projects. Two steps to consider in the future include, first, encouraging submission of a greater percentage of senior projects and, second, adopting a policy encouraging faculty scholars who publish to retain ownership of their own copyrights rather than giving all of those rights to their publishers. When faculty retain their rights, the cost of placing these works in Digital Commons is greatly reduced and faculty benefit from global exposure to their work. Some major research universities including MIT, Harvard, and Princeton have already adopted such policies; other institutions, such as San Jose State University, have adopted voluntary resolutions in support of open access to scholarly work.[vii]

CPR Action Item: Make the RPT Process More Clear and Consistent. The CPR report identified a lack of clarity and consistency in the RPT process as a significant concern among faculty members. This lack is more glaring at the university level because Cal Poly, unlike many other campuses, does not provide for faculty input in the RPT process after promotion files have moved past the college-level committee. A university-level RPT committee would address this issue by providing a consistent interpretation and implementation of RPT guidelines, including the use of professional development plans, across all colleges. The task force that developed AS-725-11 began developing a policy on the responsibilities of a university-level RPT committee. In AY 2011-12, the Academic Senate will establish a new task force to complete the policy.

The Teacher-Scholar Model and Student Learning. Though the literature includes many examples of a lack of connection between teaching quality and research productivity, these cases are often observed at doctoral-granting institutions and liberal arts colleges, which represent two extremes on the teacher-scholar spectrum. AS-725-11 makes it clear that Cal Poly strives for a nexus between teaching and RSCA that enhances student learning. One way to achieve this nexus is to involve students in faculty research, an experience that George Kuh has identified as a high-impact practice.[viii] Though the literature on such practices supports the value of undergraduate research in general, the data the university has gathered to date addresses only student involvement in faculty research.

According to the 2011 NSSE, Cal Poly freshmen have done less work on faculty research projects outside of course or program requirements (0.03 on a scale of 0 to 1 with 0 being a combination of "have not decided," "do not plan to do," and "plan to do" and 1 being "done," i.e., .03 is the percentage responding "done") than their CSU (0.05), polytechnic (0.05), and NSSE peers (0.05). However, by their senior year, Cal Poly students have done significantly more work on faculty research projects (0.28) than their CSU (0.13) and NSSE peers (0.20) and a comparable amount to their polytechnic peers (0.26).

The results from the EER Student Survey begin to demonstrate whether increasing levels of this interaction benefit students in the way the literature suggests. The large majority of respondents indicated that they had participated "quite a bit" or "very much" in what Kuh calls "educationally purposeful activities," as would be expected for the senior project (see "*Student Learning*," pp. 15-16). 6% selected "student participation in faculty research project" as a form of senior project. When comparing those who selected student participation in a faculty research project against all others who did not select that category, a greater percentage of those who participated discussed ideas with faculty members outside class (84% vs. 63% responding "quite a bit" or "very often"). In addition, respondents participating in faculty research were more engaged in substantive matters over extended periods of time compared with those who did not (85% vs. 69% responding "quite a bit" or "very much"). The one noticeable difference in contribution to ULO achievement between respondents who participated in faculty research and those who did not was for working productively in groups (78% vs. 54% responding "quite a bit" or "very much").

It is important to remember, however, that these are indirect measures; if Cal Poly is going to espouse the value of student participation in faculty RSCA, then the university ought to devise a direct assessment of its impact. The senior project could be an artifact of this assessment, but the project does not always take the form of undergraduate research. Other assessment possibilities include administering a standardized test or embedding test questions in senior-level courses and comparing the performance of students who had and had not participated in faculty RSCA. The results could be reported during program review and thereby enhance both program- and university-level knowledge of the effects of RSCA on student learning as well as the university's ability to improve those experiences.

Recommended Action Items

4. **Further define progress indicators for the teacher-scholar model, set targets, and assess progress toward their achievement (p. 43).**
5. **Continue to work toward an electronic workflow solution to the problem of tracking RSCA more effectively through the RPT process; to provide more current data, consider requiring annual reports at least of departments (43).**
6. **Revise the program review guidelines to request both the documentation of RSCA at the program level and the assessment of its contribution to student learning (43, 45).**
7. **Channel new funds to protect and expand access to scholarly and professional information through Kennedy Library (43).**
8. **Promote greater student and faculty participation in Digital Commons by developing a campus-wide policy to encourage students to submit their senior projects to Digital Commons and faculty members to retain their copyrights when publishing RSCA (44).**
9. **Establish a university-level RPT committee to ensure that RPT procedures and policies for each college reflect the teacher-scholar model as described in AS-725-11 and to provide consistent interpretation and implementation of RPT guidelines including the use of professional development plans across all colleges (44).**

Integration and Student Learning

When the self-study began, the leaders posited a Venn diagram showing student learning as a combination of major, GE, and co-curricular experiences (see *Figure 4.1*). The CPR Student Survey and *CPR Faculty/Staff Survey* confirmed the value of this illustration but also revealed an important missing component: student employment. Almost 80% of student respondents agreed or strongly agreed that off-campus employment would help them in their personal and professional lives. Almost 70% agreed or strongly agreed that on-campus employment would help them in the same way, while 72% of faculty/staff respondents said the same for both types of employment.

With the educational terrain thus more broadly established, the Integration and Student Learning Working Group shifted its focus to considering how Cal Poly intentionally integrates student learning in all of these venues. Does the university help students make connections between their various experiences? Does it provide guidance to ensure that all students can have access to different kinds of experiences? To answer these questions, the group turned to the ULOs as a set of organizing principles that can transform student learning into a cohesive whole.

WASC Recommendation: Assure Alignment between University, Program, and Course Learning Objectives. Alignment is the first step toward integration. At the program level, the alignment of course learning outcomes to PLOs promotes the integration of course-level expectations for students into the larger expectations of the program. At the institutional level, the alignment of PLOs to the ULOs promotes the integration of program-level expectations for students into the larger expectations of the university. In either case, mapping is the vehicle for identifying strengths and weaknesses in the curriculum and co-curriculum.

As mentioned in Organizational Learning, all the departments in Student Affairs have aligned their PLOs with the ULOs as an aspect of program review. In AY 2007-08, following the establishment of the ULOs, the program review process in Academic Affairs began to require programs to map their PLOs to the ULOs. However, not all academic programs have undergone review since the establishment of the ULOs, which meant that the university could not be certain that all programs have aligned PLOs.

To address this situation, the Academic Senate in cooperation with the working group engaged all academic programs in an alignment exercise. In Fall 2010, the senate asked each program to state its PLOs and to rate the contribution of each PLO to student attainment of the ULOs on a scale of 0 to 3 with 0 being does not contribute and 3 being greatly contributes. As has been the practice throughout the self-study, composite ULOs were broken down into their component skills.

Because multiple PLOs can address a ULO at different levels, the Director of Institutional Planning and Analysis used maximum scores to aggregate results; if one PLO out of six scored 3 for "greatly contributes" for a particular ULO, the program's overall score for that ULO was 3. Those scores were then averaged to arrive at college- and university-level measures of alignment for each ULO. The program, college, and university scores thus describe the maximum amount of PLO contribution to the attainment of each ULO rather than the number of PLOs that are aligned with each ULO (see Appendix 4.2 (EXCEL file in EER Data Portfolio).

It is important to remember that these results are based on self-reporting. Still, with 94% or 60 of 64 undergraduate programs reporting, some interesting trends emerge. The overall university measure of alignment across all ULOs was 2.57, solidly between "contributes" and "greatly contributes." "Demonstrate expertise in a scholarly discipline" was the most highly ranked ULO at 2.80, followed by "think critically" at 2.78 and "communicate effectively: written" at 2.71. "Make reasoned decisions based on an awareness of issues related to sustainability" was the lowest ranked ULO at 2.27, followed by "make reasoned decisions based on a respect for diversity" at 2.35 and "make reasoned decisions based on an understanding of ethics" at 2.44. These results are not surprising, considering those provided elsewhere in this report (see "*Student Learning*," pp. 16-17). Though the subjective nature of the reporting must be taken into account, the results still indicate that, on average and at the university level, PLOs are aligned to the ULOs at a level above contributes.

College-level results were less consistent but showed generally strong alignment. Overall scores varied from a low of 2.42 for Science and Math to a high of 2.86 for Engineering. College averages for most ULOs fell in the range between "contributes" and "greatly contributes" with a few exceptions. Architecture's average of 1.80 for "work productively as individuals" and "make reasoned decisions based on an awareness of issues related to sustainability" put it at slightly below "contributes" for those ULOs. Science and Math averaged 1.76 for "make reasoned decisions based on a respect for ethics," 1.65 for "make reasoned decisions based on a respect for diversity," and 1.47 for "make reasoned decisions based on a respect for sustainability." Business averaged a 3.00 for seven of the ULOs, the highest number of "greatly contributes" of any college. The greatest variation in results among colleges was "make reasoned decisions based on a respect for sustainability" with a range of 1.47-3.00. The ULO whose alignment was most consistent was "work productively in groups" with a range of 2.60-2.97.

At the program level, only eight claimed to be fully aligned with 3.00 scores for all ULOs. At the other extreme, only five reported 0, or no alignment, for any of the ULOs. The GE program also completed the exercise with an overall alignment average of 2.46. GE reported "greatly contributes" for seven of the fifteen components and "slightly contributes" for only one ULO, "work productively in groups."[ix]

The mapping process in program review will only improve program-level alignment over time. Given the somewhat recent adoption of the ULOs in Winter 2007, however, the level of alignment already achieved university-wide is encouraging: almost all programs can be said to have PLOs aligned with the ULOs.

WASC Recommendation: Assure that All Learning Objectives Appear Systematically in University Documents. In response to this recommendation, the Integration and Student Learning Working Group drafted two Academic Senate resolutions: one on posting PLOs in the *Cal Poly Catalog* and the other on requiring course learning outcomes (CLOs) in syllabi. To prepare senators for debate, the co-chairs and the Faculty Director of the Self-Study met with all of the college caucuses, which presented a spectrum of reactions to both proposals. Little concern existed regarding the publication of PLOs in the catalog, probably because many faculty members are familiar with their use in program review. Most of the caucuses seemed to support the inclusion of CLOs in syllabi, probably because the outcomes are familiar to faculty members in externally approved or accredited programs, but some senators expressed concern about making their inclusion a university mandate.

Unanimous acceptance in Spring 2011 of AS-732-11 *Resolution on Posting Program Learning Objectives in the Cal Poly Online Catalog* represented the senate's commitment to transparency in response to the WASC recommendation. As cited in the resolution, the working group chose the online catalog as the most appropriate place to publish PLOs because it is

the official source of university information, because the two-year catalog cycle would give programs the opportunity to update their objectives if needed, and because this information would be useful to parents and applicants when choosing a major. The Registrar has already implemented the resolution.

The original CLO resolution proposed changing the *Course Syllabi Policy* to require learning outcomes in all syllabi. Over time, the authors of the resolution began to question whether it was the most effective response to the WASC recommendation for two reasons: changing the syllabus policy did not address the problem of courses created before 2000, when the curriculum process first began to require the statement of CLOs, and it did not present a "systematic" response to the publication issue. Instead, the final version of the resolution highlighted the new course proposal form, which now requires a statement of ULOs, PLOs, and CLOs, and made an important statement of principle regarding outcomes-based instruction: that all courses have CLOs aligned with PLOs, that CLOs be published along with other course information in the online catalog, and, finally, that they be communicated to students "via the syllabus or other means appropriate to the course." The senate will vote on the resolution in Winter 2012.

The Senior Project as an Integrating Experience. Cal Poly's *Senior Project Policy* calls for a capstone experience that "integrates theory and application from across the student's undergraduate educational experiences." Until recently, however, the university had little evidence to suggest whether the project was, in practice, this type of integrating exercise. To obtain an overview of current practices, the EER Student Survey asked students how often they had integrated ideas or information from various sources in their student projects; 90% of respondents replied "quite a bit" or "very often." Other results suggest whether students simply integrate information from various major courses or rather from a broader collection of learning experiences. When asked how often they put together ideas or concepts from different courses, 77% of respondents replied "quite a bit" or "very often." A promising 60% replied that they had opportunities to see how what they were learning works in different settings, both on and off campus, "quite a bit" or "very much." When asked to what extent their senior project drew on experiences in various learning venues, 44% replied that it drew on employment off campus "quite a bit" or "very much," and 38% replied similarly regarding co-curricular/extracurricular activities. Though integrating ideas from different courses clearly tops the list by a wide margin, the extent to which students perceive their work and co-curricular activities as contributing to their senior project is encouraging for an exercise that is housed wholly in academic departments.

The exception to these results was that, when students were asked to what extent their senior project drew on their experience with courses in the GE curriculum, only 18% of respondents replied "quite a bit" or "very much." That number is in stark contrast to the 56% of respondents who said their project consisted primarily of a written document and the additional 38% who said it contained a written component, making a total of 94% of respondents who used writing skills that are a focus of GE. This result is consistent with the tendency of respondents in the CPR Student Survey not to recognize the impact of GE courses compared to major courses.

Overall, it appears that the senior project is an integrating experience at some level for most students, but they appear not to recognize the GE contribution to their capstone experiences. This perception might change if staff and faculty did a better job of explaining the value of GE throughout their students' Cal Poly careers and established better partnerships between GE and the major, partnerships focused on enhancing student learning. In addition, if students, as an integral part of their senior projects, had the opportunity to reflect back on their experiences through the vehicle of an e-portfolio, they might better understand the ways in which their projects integrated skills learned not only in GE but also in the other venues that make up the Cal Poly experience. Developing a process of reflecting and recognizing how skills gained in one venue transfer to another is an aspect of metacognition that will help students become expert lifelong learners and whole-system thinkers, as advocated by the university's strategic planning.

WASC Recommendation: Clarify Leadership for Integration and Student Learning. The challenge in responding to this recommendation begins with a question that arose during the review of program review: who is responsible for ensuring student attainment of all the ULOs, whether this learning occurs in GE, the major, the co-curriculum, or the workplace? Because students declare a major upon matriculation, academic programs are perhaps the most natural units to take on this task as students will remain connected with the programs throughout their Cal Poly careers (see "*Organizational Learning*," p. 38).

The difficulty with this position lies in the fact that Cal Poly's institutional culture does not always promote whole-student thinking. The units tend to concern themselves with discrete aspects of the university's functioning and therefore with

only parts of the students' educational experience. Academic departments consider students' professional development but may resist doing the same for their personal development, seeing it as outside the departments' purview. One solution to this problem may be more intentionally connecting student learning to student development theory, because the latter recognizes the importance of integrating all aspects of students' lives by considering the individual learner as the union of all components of the learning environment. Perhaps framing the goals for intentional student engagement and the integration of student learning around high-impact practices, many of which address multiple elements of student development, could help the university organize its efforts around the whole student. Cal Poly is perhaps uniquely poised to do just that because of the prevalence of Learn by Doing and its considerable overlap with these practices.

Any viable leadership structure for integration and student learning must take the whole student into account and would therefore require intentional dialogue and sustained cooperation between all units, as well as a commitment to valuing and integrating different approaches that reflect different types of expertise. Faculty members and student development professionals could learn from each other, giving all parties a clearer vision of how to educate whole-system thinkers. This kind of collaboration would represent a significant gain on a campus where units historically prize their autonomy. In recent years, some progress has been made in creating connections both within Academic Affairs and among the various campus advising services; these efforts need to be extended to inter-divisional relationships. The president decides the administrative structure of the university; doing so in a way that encourages genuine collaboration among the divisional leadership would help the institution move forward with a truly integrative vision.

Recommended Action Items

10. **Encourage all programs to have PLOs contributing to each of the ULOs at some level (p. 46).**
11. **Promote student metacognition by implementing an e-portfolio and revising the Senior Project Policy to include a written, reflective component (47).**
12. **Promote whole-student thinking across all divisions of the university (48).**
    - Connect student learning to student development theory through the vehicle of programming in the Center for Teaching and Learning.
    - Leverage Learn by Doing by using high-impact practices to organize intentional student engagement and integrated learning experiences.
13. **Foster respectful, sustained, inter-divisional collaboration by examining the leadership structure of the university and making changes to foster collaboration. (pp. 19-20).**

Conclusion

It has been four years since Cal Poly officially began its self-study, and the environment in which we conclude is not the environment in which we began. If the university were starting now we might design the self-study in a different way, yet the themes we did choose—Our Polytechnic Identity in the Twenty-First Century, Learn by Doing, the Teacher-Scholar Model, and Integration and Student Learning—have proven pertinent even to the last paragraph of this report. Because of the project's ability to shine a light on longstanding issues, we have been able to develop policy statements that address critical aspects of our institutional identity. These statements have already impacted the direction of the campus, and they will help sustain progress through a financially uncertain future that is nevertheless ripe with possibilities.

There are some things that we would have done whether or not the university had to reaffirm its accreditation, such as striving to maintain our historical investment in student success and an active, student-centered educational environment. This commitment has only been sharpened under new leadership and, surprisingly, in response to further decline in state support. However, there are some efforts we would probably not have made without the reality of the reaffirmation process to sharpen the collective mind. These efforts, which include the ULO-based and senior-project assessments as well as the review of program review, are as ambitious as anything the university has attempted.

The challenge now is how to sustain and organize such efforts not only in the Administration Building but also in all parts of the campus. The process has highlighted the shortage of institutional research capacity, which was noted in the CPR report and is noted here again. Institutional Planning and Analysis has provided an admirable level of support given its limited staff, but it will be difficult to further promote a culture of evidence and inquiry at Cal Poly without more centralized support; the staff and faculty simply do not have the expertise or the resources to fully maintain an ongoing investigation of educational effectiveness. The university also needs a comprehensive assessment plan to ensure that the resources when provided are well deployed. Boasting a committed and energetic staff and faculty, Cal Poly has not lacked for individual efforts; it has lacked the coordination and collaboration that would integrate those efforts under the twin banners of whole-system thinking, as advocated by the strategic plan, and whole-student thinking, as finally advocated by the self-study.

Perforce, the self-study has been an exercise in developing new skills and new collaborative relationships. Chief among these have been the strengthened bond between professionals in Student Affairs and Academic Affairs. The implications of institutional integration on student learning and success were not well understood at the outset. The barriers to integration had been so thoroughly institutionalized that it took the working group some time to fully appreciate the implications of its own theme, which are radical and transformative, contradicting a well-developed bureaucratic tendency to divide the work into ever-smaller parts. Hopefully the habits of respect and cooperation that have developed in recent years will endure, and the university will continue to become more truly centered on the needs and aspirations of the whole, developing student.

Figures

Student Learning

Figure 1.1. Numbers of ULO Project on Writing Participants as a Function of College and Class Year

Class Year	CAED	CAFES	CENG	CLA	OCOB	COSAM	TOTAL
Freshman	12	14	33	6	14	8	87
Sophomore	0	7	16	11	4	3	41
Junior	2	13	13	12	8	5	53
Senior	18	7	11	27	3	23	89
TOTAL	32	41	73	56	29	39	270

Figure 1.2: Overall Mean Scores Across Class Levels for ULO Project on Writing Participants

		Poor/No Attainment (Score 0/1 < 2)		Average Attainment (Score 2 < 3)		Good Attainment (Score 3 ≤ 4)		
Class	N	n	%	n	%	N	%	Mean
Freshman	87	44	50.1%	38	44.7%	5	5.8%	1.97
Sophomore	41	11	26.8%	27	65.9%	3	7.3%	2.32
Junior	53	12	22.6%	36	67.9%	5	9.4%	2.28
Senior	89	23	25.8%	54	60.7%	12	13.5%	2.36
TOTAL	270	90	33.3%	155	57.4%	25	9.2%	2.21

Figure 1.3: Percentages and Means (M) of ULO Project on Writing Participants Scoring at least a 2 (Average Attainment) as a Function of Rubric Trait Scores and Class Levels

Class Year	N	Purpose	Synthesis	Support	Style	Mechanics
Freshman	87	68.2% (*M* = 2.09)	59.1% (*M* = 1.87)	48.9% (*M* = 1.78)	65.9% (*M* = 2.00)	72.7% (*M* = 2.10)
Sophomore	41	87.8% (*M* = 2.51)	78.0% (*M* = 2.13)	75.6% (*M* = 2.20)	82.9% (*M* = 2.26)	92.6% (*M* = 2.51)
Junior	53	76.0% (*M* = 2.41)	75.9% (*M* = 2.19)	75.9% (*M* = 2.12)	72.3% (*M* = 2.14)	88.9% (*M* = 2.51)
Senior	89	76.3% (*M* = 2.45)	73.0% (*M* = 2.23)	83.1% (*M* = 2.37)	76.4% (*M* = 2.28)	83.1% (*M* = 2.47)
TOTAL	270	75.4% (*M* = 2.33)	69.9% (*M* = 2.09)	69.5% (*M* = 2.11)	73.2% (*M* = 2.16)	82.4% (*M* = 2.36)

Figure 1.4: Written Communication Rankings on Recent Employer Surveys

College	Program/College	Survey Year	Mean Employer Importance	Demonstrated Skill Attainment	Rank*
CENG	College-Wide	2008-09	4.41	3.86	First
OCOB	College-Wide	2008-09	4.06	3.80	First
CAFES	NRM: Forestry and Natural Resources	2009-10	4.59	3.88	Second
CAFES	NRM: Environmental Management and Protection	2009-10	4.62	3.75	First
CLA	GRC: Graphic Communications	2009-10	4.63	3.95	First

* of *Communication Skills* among Personal Qualities Valued by Employers

Figure 1.5: Percentages and Mean Scores for ULO Project on Oral Communication Traits

Trait	N	Insufficient/Below Average	Average	Good	Excellent	Mean	Standard Deviation
Use of Supporting Material	102	13.7%	35.3%	45.1%	5.9%	3.42	.83
Language Use	102	7.8%	56.9%	29.4%	5.9%	3.33	.71
Central Message	102	11.8%	47.1%	37.3%	3.9%	3.31	.78
Organization	102	10.8%	57.8%	27.5%	3.9%	3.24	.70
Nonverbal Delivery	102	23.5%	49.0%	25.5%	2.0%	3.06	.75
Verbal Delivery	102	22.5%	50.0%	25.5%	2.0%	3.03	.83
Use of Visual Aids*	75	16.7%	26.5%	22.5%	7.8%	3.27	.99

* Not all students used visual aids.

Figure 1.6. Numbers of ULO Project on Diversity Participants across All Traits as a Function of College and Class Level

Class Year	CAED	CAFES	CENG	CLA	OCOB	COSAM	TOTAL
Freshman	8	15	29	29	3	18	102
Junior	1	11	3	14	15	12	56
Senior	1	4	9	6	8	16	44
TOTAL DLO 1	*10*	*30*	*41*	*49*	*26*	*46*	*202*
Freshman	13	17	19	19	6	49	123
Junior	3	11	6	13	22	3	58
Senior	4	7	8	13	7	17	56
TOTAL DLO 2	*20*	*35*	*33*	*45*	*35*	*69*	*237*
Freshman	8	16	17	16	4	35	96
Junior	1	11	6	14	25	8	65
Senior	4	8	11	18	10	16	67
TOTAL DLO 3	*13*	*35*	*34*	*48*	*39*	*59*	*228*

Figure 1.7. Mean Scores and Distribution of Scores by Various Student Categories on DLO 1

Student Category		No Response	Incomplete	Basic	Moderate	Complex	
Class Level	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
Freshmen	102	16.7%	53.9%	27.5%	2.0%	0.0%	1.56
Juniors	56	10.7%	42.9%	33.9%	12.5%	0.0%	1.93
Seniors	44	15.9%	27.3%	36.4%	18.2%	2.3%	2.04
College	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
CAFES	30	30.0%	50.0%	16.7%	3.3%	0.0%	1.29
CAED	10	30.0%	40.0%	30.0%	0.0%	0.0%	1.38
CENG	41	19.5%	34.1%	39.0%	7.3%	0.0%	1.81
CLA	49	12.2%	55.1%	28.6%	4.1%	0.0%	1.71
OCOB	26	3.8%	30.8%	38.5%	23.1%	3.8%	2.34
COSAM	46	6.5%	50.0%	32.6%	10.9%	0.0%	1.88
Gender	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
Female	103	22.3%	43.7%	28.2%	5.8%	0.0%	1.62
Male	99	7.1%	46.5%	34.3%	11.1%	1.0%	1.93
Ethnicity/Race	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
Asian	20	25.0%	90.9%	9.1%	0.0%	0.0%	1.81
Hispanic/Latino	11	0.0%	26.6%	50.5%	14.7%	0.9%	1.73
Multi-Racial	28	2.6%	25.6%	46.2%	23.1%	2.6%	1.95
White	129	14.0%	40.3%	36.4%	8.5%	0.8%	1.82
Other*	14	28.6%	50.0%	14.3%	7.1%	0.0%	1.41
Survey Type	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
In-Class	106	21.7%	53.8%	23.6%	0.9%	0.0%	1.46
Online	96	7.3%	35.4%	39.6%	16.7%	1.0%	2.11

*Aggregates across responses of African-American, Native American, Other/Unknown, and Non-Resident Alien

Figure 1.8. Mean Scores and Distribution of Scores by Various Student Categories on DLO 2

Student Category		No Response	Incomplete	Basic	Moderate	Complex	
Class Level	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
Freshmen	123	17.9%	54.5%	26.8%	0.8%	0.0%	1.55
Juniors	58	15.5%	37.9%	34.5%	12.1%	0.0%	1.90
Seniors	56	10.7%	41.1%	32.1%	14.3%	1.8%	1.98
College	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
CAFES	35	28.6%	45.7%	17.1%	8.6%	0.0%	1.48
CAED	20	5.0%	65.0%	25.0%	5.0%	0.0%	1.74
CENG	33	12.1%	69.7%	15.2%	3.0%	0.0%	1.51
CLA	45	22.2%	42.2%	31.1%	4.4%	0.0%	1.60
OCOB	35	17.1%	37.1%	31.4%	14.3%	0.0%	1.94
COSAM	69	8.7%	40.6%	43.5%	5.8%	1.4%	1.97
Gender	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
Female	117	13.7%	53.0%	26.5%	6.0%	0.9%	1.68
Male	120	17.5%	41.7%	33.3%	7.5%	0.0%	1.80
Ethnicity/Race	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
Asian	25	16.0%	52.0%	28.0%	0.0%	4.0%	1.73
Hispanic/Latino	19	5.3%	57.9%	26.3%	10.5%	0.0%	1.88
Multi-Racial	27	7.4%	59.3%	33.3%	0.0%	0.0%	1.68
White	143	16.8%	42.0%	32.2%	9.1%	0.0%	1.78
Other*	23	26.1%	52.2%	17.4%	4.3%	0.0%	1.46
Survey Type	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
In-Class	92	21.7%	58.7%	18.5%	1.1%	0.0%	1.45
Online	145	11.7%	40.0%	37.2%	10.3%	0.7%	1.92

*Aggregates across responses of African-American, Native American, Other/Unknown, and Non-Resident Alien

Figure 1.9. Mean Scores and Distribution of Scores by Various Student Categories on DLO 3

Student Category		No Response	Incomplete	Basic	Moderate	Complex	
Class Level	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
Freshmen	96	29.2%	45.8%	19.8%	5.2%	0.0%	1.44
Juniors	65	12.3%	32.3%	44.6%	10.8%	0.0%	2.06
Seniors	67	6.0%	29.9%	44.8%	19.4%	0.0%	2.19
College	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
CAFES	35	22.9%	51.4%	25.7%	0.0%	0.0%	1.46
CAED	13	30.8%	53.8%	15.4%	0.0%	0.0%	1.38
CENG	34	32.4%	35.3%	23.5%	8.8%	0.0%	1.60
CLA	48	14.6%	27.1%	45.8%	12.5%	0.0%	2.00
OCOB	39	5.1%	25.6%	46.2%	23.1%	0.0%	2.33
COSAM	59	13.6%	42.4%	32.2%	11.9%	0.0%	1.84
Gender	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
Female	104	20.2%	43.3%	31.7%	4.8%	0.0%	1.66
Male	124	15.3%	32.3%	36.3%	16.1%	0.0%	1.99
Ethnicity/Race	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
Asian	26	11.5%	38.5%	22.6%	9.7%	0.0%	2.02
Hispanic/Latino	31	29.0%	38.7%	22.6%	9.7%	0.0%	1.66
Multi-Racial	31	12.9%	41.9%	29.0%	16.1%	0.0%	1.99
White	128	17.2%	32.8%	39.1%	10.9%	0.0%	1.85
Other*	12	16.7%	66.67%	16.67%	0.0%	0.0%	1.36
Survey Type	***N***	***0***	***1***	***2***	***3***	***4***	***Mean***
In-Class	109	28.4%	46.8%	20.2%	4.6%	0.0%	1.46
Online	119	7.6%	28.6%	47.1%	16.8%	0.0%	2.18

*Aggregates across responses of African-American, Native American, Other/Unknown, and Non-Resident Alien

Figure 1.10. Mean Response Results for Selected Information Literacy Items as a Function of Class Level and Library Instruction on Research Methods

1. Which of the following is the most promising research question/most appropriate thesis statement for your paper?						
Class Level**	***n***	**Instruction****	**SD**	***n***	**No Instruction**	**SD**
Lower Division	175	.691	.463	112	.652	.478
Upper Division	249	.831	.375	262	.737	.441
2. Of the searches listed below, which will get you the MOST results?						
Class Level*	***n***	**Instruction**	**SD**	***n***	**No Instruction**	**SD**
Lower Division	172	.546	.499	107	.570	.497
Upper Division	247	.636	.482	260	.612	.488
3. The same searches are listed again here. Which will get you the FEWEST total results?						
Class Level**	***n***	**Instruction**	**SD**	***n***	**No Instruction**	**SD**
Lower Division	171	.690	.464	107	.664	.474
Upper Division	247	.793	.406	261	.774	.419
4. Examine this citation [citation given]. Is this citation for …?						
Class Level**	***n***	**Instruction****	**SD**	***n***	**No Instruction**	**SD**
Lower Division	169	.432	.497	99	.303	.461
Upper Division	242	.550	.499	251	.478	.500
5. When is it ethical to use the ideas of another person in a research paper?						
Class Level	***n***	**Instruction**	**SD**	***n***	**No Instruction**	**SD**
Lower Division	168	.911	.286	101	.891	.313
Upper Division	240	.892	.310	249	.901	.297

* $p = .08$, ** $p < .05$ for main effects of Class Level (lower division vs. upper division) and/or Instruction (instruction vs. no instruction)

Figure 1.11. Numbers of ULO Project on Ethics Participants as a Function of College and Class Year

Class Year	CAED	CAFES	CENG	CLA	OCOB	COSAM	TOTAL
First Year	3	4	7	11	5	3	33
Second Year	3	6	17	8	8	6	48
Third Year	5	4	43	5	9	22	88
Fourth Year	6	3	26	5	20	9	69
Fifth Year	4	1	11	1	2	7	26
TOTAL	21	18	104	30	44	57	264

Figure 1.12. Ethical Learning Outcome Scores as a Function of Class Year

Class Year	N	Mean Total Score
First Year	33	11.36
Second Year	48	12.82
Third Year	88	11.97
Fourth Year	69	12.83
Fifth Year	26	13.77

Figure 1.13. Ethical Learning Outcome Scores as a Function of College

College	N	Mean Total Score	Mean Rank
CAED	21	11.86	123.86
CAFES	18	10.78	103.03
CENG	104	11.99	126.01
CLA	30	11.97	122.63
OCOB	44	12.36	131.88
COSAM	47	14.74	168.88

Figure 1.14. Ethical Learning Outcome Scores as a Function of Trait and Ethics Course Enrollment

	Had not taken a university-level ethics course		Had taken a university-level ethics course	
Trait	**Mean Score (*n* = 112)**	**Standard Deviation**	**Mean Score (*n* = 152)**	**Standard Deviation**
Understanding Different Ethical Theories/Concepts	.339	.164	.376	.171
Ethical Issue Recognition	.397	.214	.395	.203
Application of Ethical Theories/Concepts	.464	.225	.437	.229
Evaluation of Different Ethical Perspectives/Concepts	.435	.262	.429	.252

Figure 1.15. Employer Survey Results for Overall Graduate Quality and Industry Readiness

College	Academic Year	Graduate Quality	Industry Readiness
OCOB - college-wide	2007	4.53	NA
CENG - college-wide	2007	4.46	4.20
CAED - college-wide	2007	4.24	4.25
OCOB - college-wide	2009	4.20	3.92
CENG - college-wide	2009	4.49	4.24
CAFES - Graduate Programs	2010	4.57	4.62
CAFES – NRM	2010	4.25	4.24
CLA – GRC	2010	4.26	4.26

Figure 1.16: Employer Assessment Data for Mechanical Engineering (1 = Strongly Disagree and 5 = Strongly Agree)

Standard	Scale	*1*	*2*	*3*	*4*	*5*	*Average*	*Employer Importance*
A	Knowledge	0%	0%	7%	59%	34%	**4.27**	**4.15**
	N	*0*	*0*	*6*	*51*	*29*	*86*	
B1	Technical Practice Design & Conduct Experiments	0%	1%	20%	47%	31%	**4.08**	**3.88**
	N	*0*	*1*	*17*	*39*	*36*	*83*	
B2	Technical Practice Analyze & Interpret Data	0%	0%	16%	52%	31%	**4.15**	**4.41**
	N	*0*	*0*	*14*	*45*	*27*	*86*	
C	Design	4%	3%	18%	47%	29%	**3.98**	**4.11**
	N	*3*	*2*	*15*	*39*	*24*	*83*	
D	Multi-disciplinary Teams	0%	0%	12%	39%	49%	**4.38**	**4.51**
	N	*0*	*0*	*10*	*33*	*42*	*85*	
E	Problem Solving	0%	0%	10%	7%	52%	**4.42**	**4.76**
	N	*0*	*0*	*9*	*32*	*45*	*86*	
F	Ethical Behavior	1%	1%	11%	39%	48%	**4.31**	**4.75**
	N	*1*	*1*	*9*	*32*	*40*	*83*	
G1	Communication - Oral	0%	0%	24%	56%	20%	**3.95**	**4.55**
	N	*0*	*0*	*21*	*48*	*17*	*86*	
G2	Communication - Written	0%	4%	26%	56%	15%	**3.82**	**4.41**
	N	*0*	*3*	*21*	*46*	*12*	*82*	
H	Global/Societal Context	1%	5%	40%	40%	14%	**3.59**	**3.51**
	N	*1*	*4*	*29*	*29*	*10*	*73*	
I	Life-Long Learning	0%	6%	24%	46%	24%	**3.88**	**4.08**
	N	*0*	*5*	*9*	*37*	*19*	*80*	
J	Contemporary Issues	0%	7%	28%	49%	16%	**3.72**	**3.69**
	N	*0*	*5*	*21*	*36*	*12*	*74*	
K	Tools	0%	3%	11%	53%	34%	**4.20**	**4.24**
	N	*0*	*2*	*9*	*42*	*27*	*80*	

Figure 1.17: Senior Project Types According to EER Program Survey Respondents

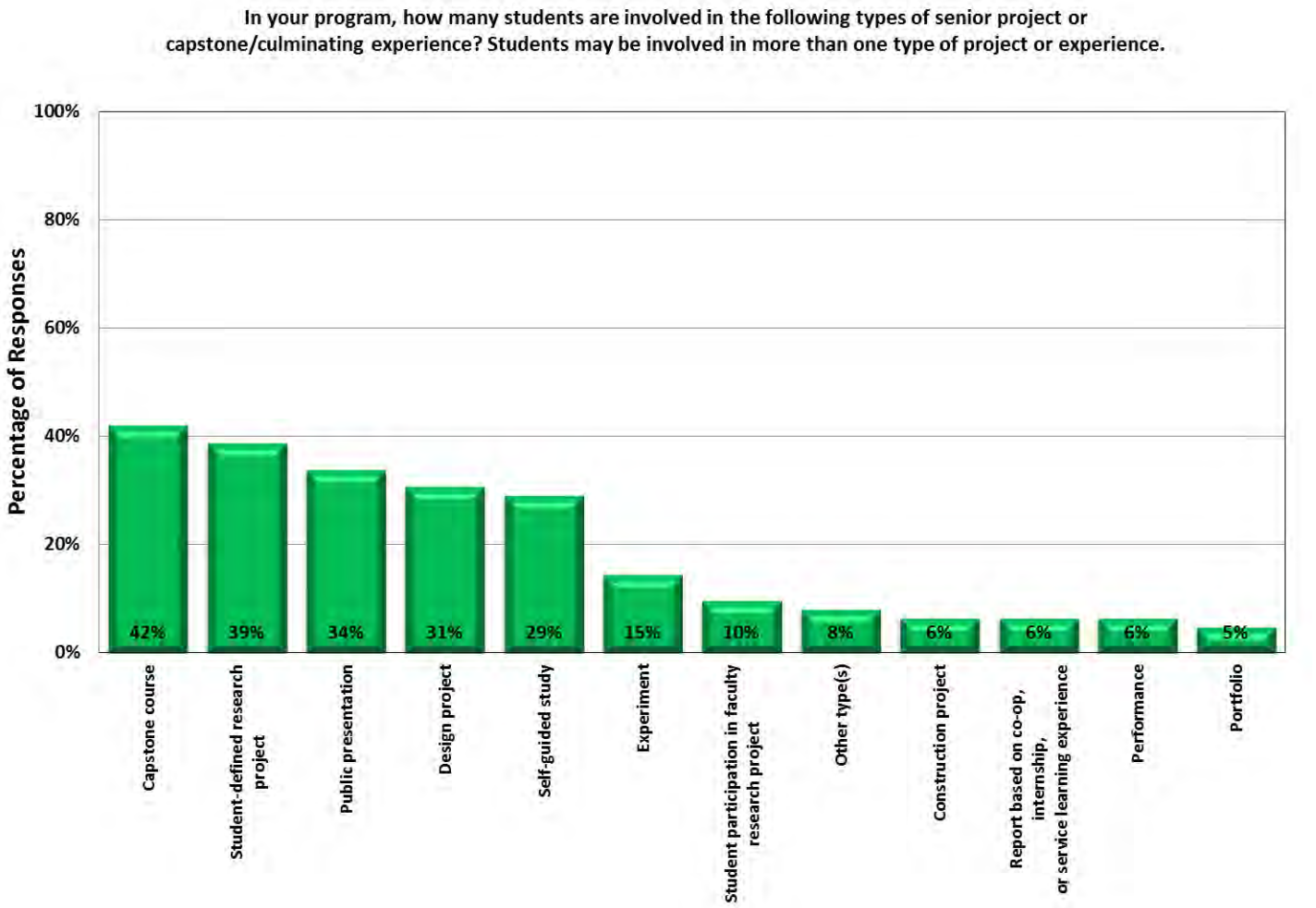


Figure 1.18: ULO Mastery Expectations: Percentage of Programs Responding All or Most to the Question:

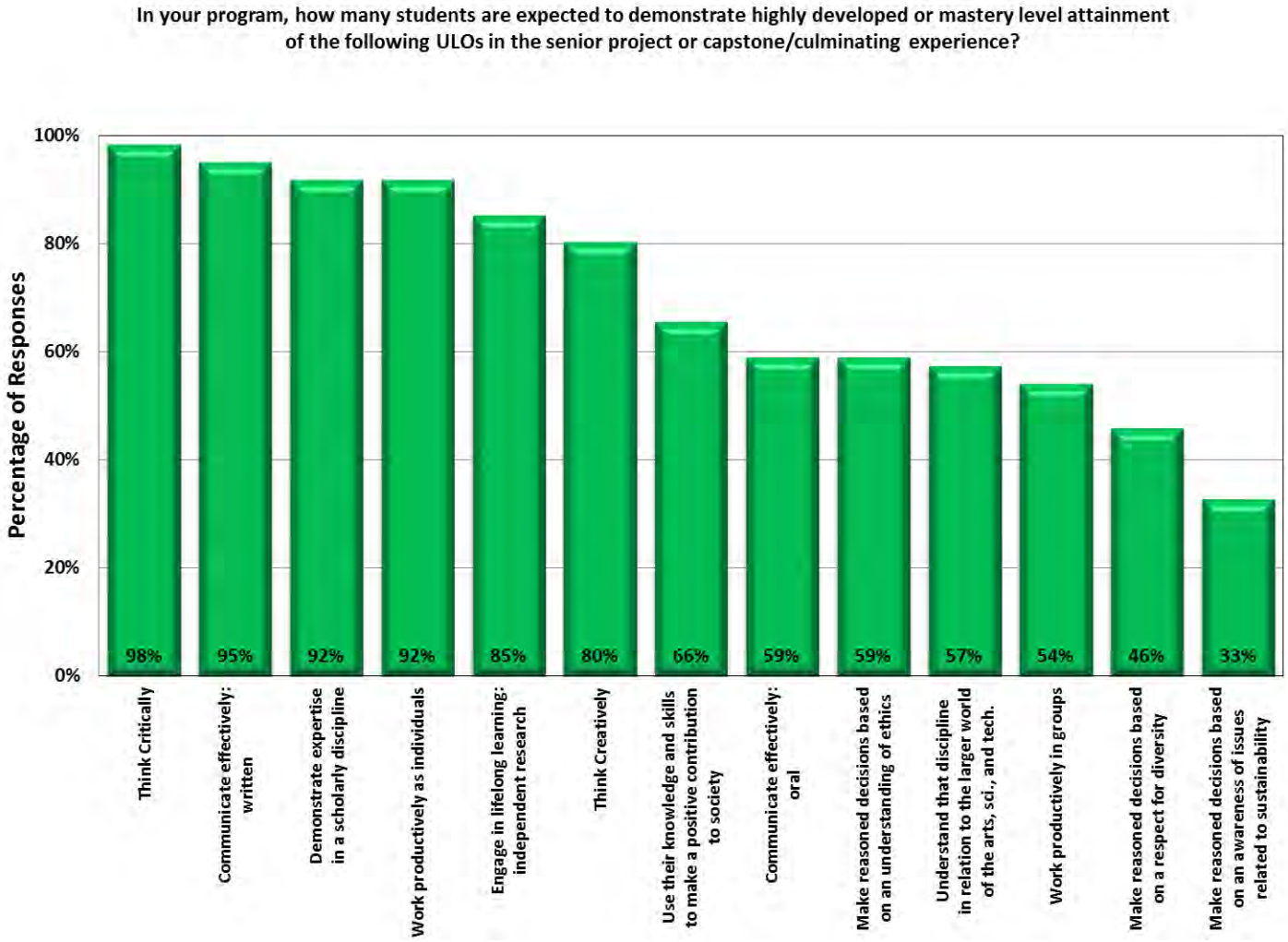


Figure 1.19: Senior Project as a Capstone for Assessing Learning Outcomes

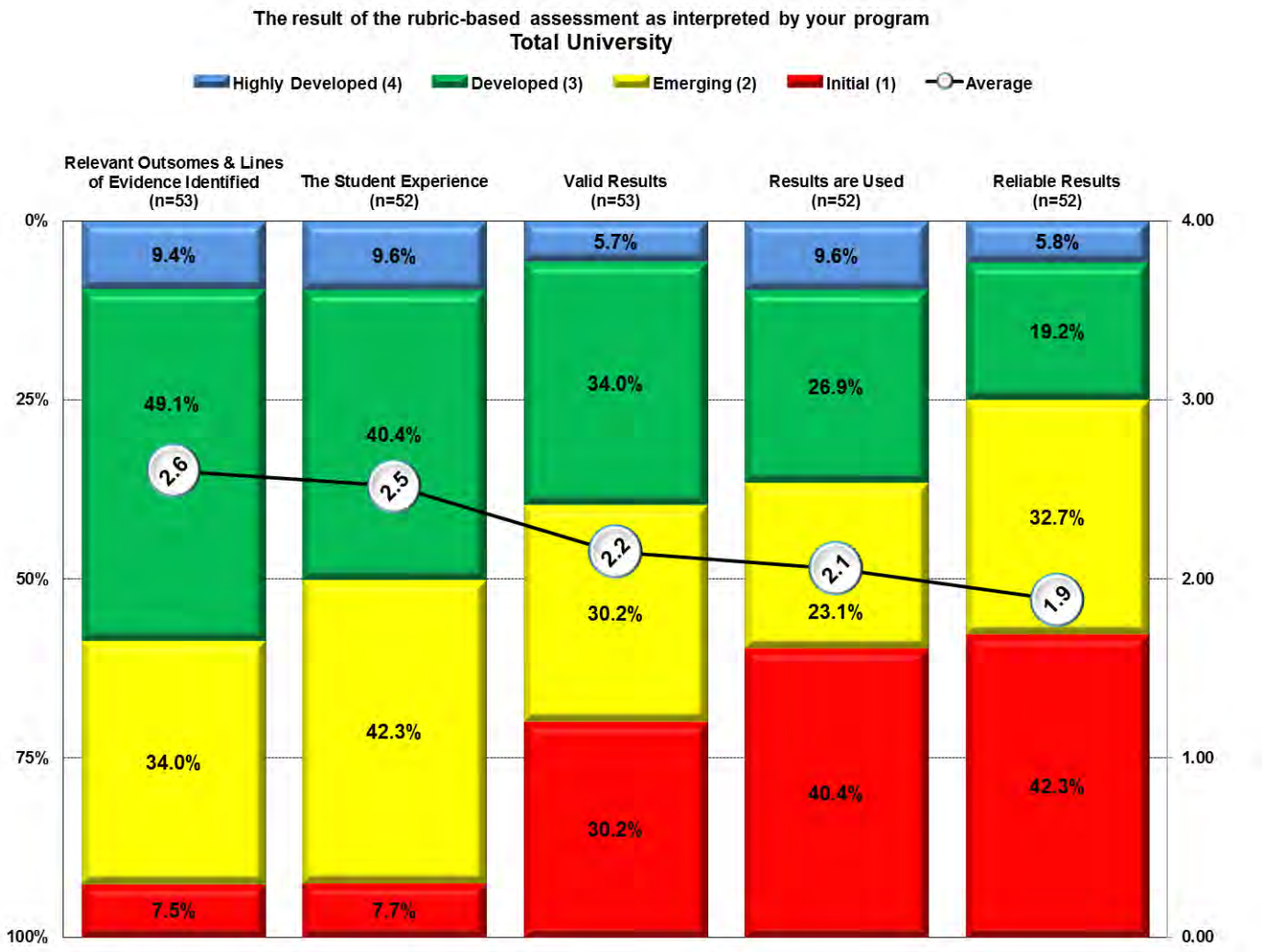


Figure 2.1: Cal Poly Four-, Five-, and Six-Year Graduation Rates for 1990-2007 First-Time Freshmen

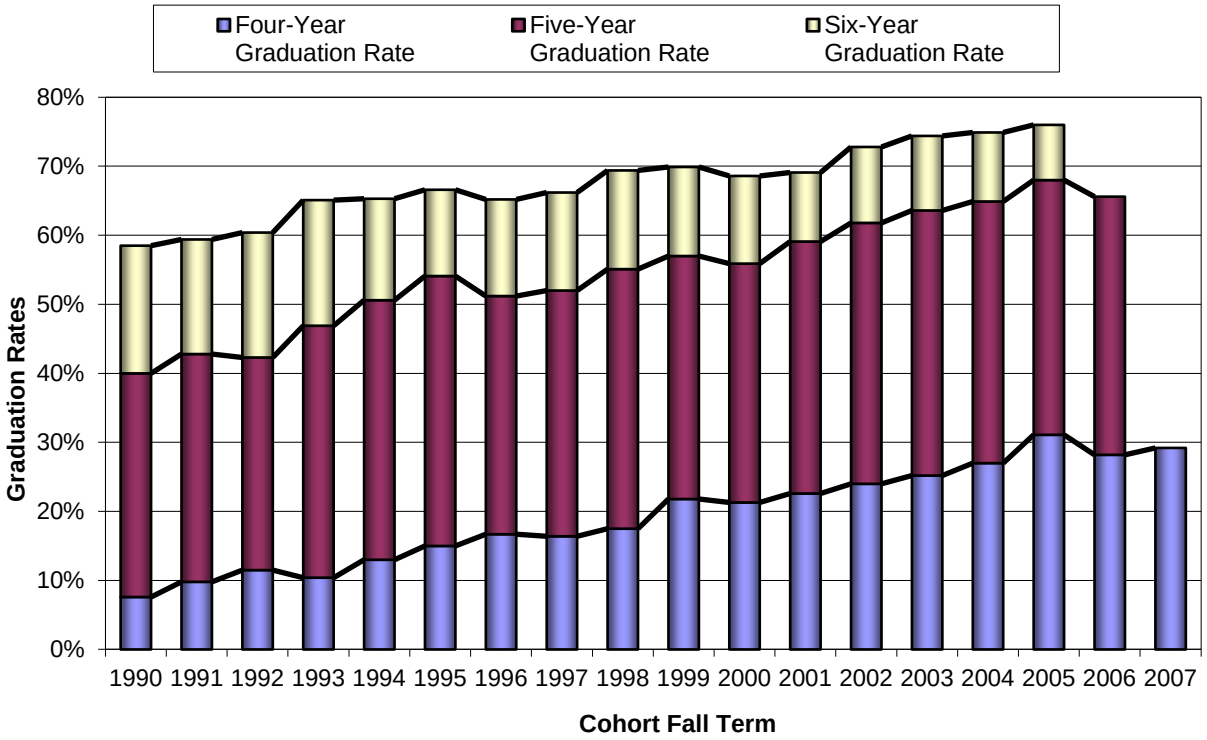


Figure 2.2: Persistence Rate Trends and Academic Strength of Incoming First-Time Freshmen 1990-2009

Fall Cohort	Original Cohort*	Average HS GPA	Average SAT Reading	Average SAT Math	Average ACT Comp.	One-Year Retention Rate	Four-Year Graduation Rate	Five-Year Graduation Rate	Six-Year Graduation Rate
1990	1,817	--	--	--	--	85.4%	7.6%	40.0%	58.5%
1991	1,626	--	--	--	--	85.0%	9.8%	42.8%	59.4%
1992	1,418	3.49	--	--	--	86.1%	11.5%	42.3%	60.4%
1993	1,676	3.53	--	--	--	87.2%	10.4%	46.9%	65.1%
1994	2,098	3.50	--	--	--	85.6%	13.0%	50.6%	65.3%
1995	2,506	3.53	542	575	--	86.4%	15.0%	54.1%	66.6%
1996	2,869	3.48	535	569	--	85.9%	16.7%	51.2%	65.2%
1997	2,291	3.59	561	586	--	87.1%	16.4%	52.0%	66.2%
1998	2,466	3.62	560	600	24.4	89.0%	17.5%	55.1%	69.4%
1999	2,852	3.63	565	595	24.4	88.6%	21.8%	57.0%	69.9%
2000	3,253	3.61	561	603	24.3	88.6%	21.3%	55.9%	68.6%
2001	3,638	3.63	564	604	24.4	88.3%	22.6%	59.1%	69.1%
2002	3,085	3.70	573	617	25.0	89.2%	24.0%	61.8%	72.8%
2003	3,011	3.73	575	619	25.2	90.0%	25.2%	63.6%	74.4%
2004	2,899	3.77	587	626	25.7	91.3%	27.0%	64.9%	74.9%
2005	3,575	3.72	584	618	25.5	90.8%	31.1%	68.0%	76.0%
2006	3,763	3.70	569	614	25.3	89.9%	28.2%	65.6%	
2007	4,419	3.71	570	612	25.5	89.2%	29.2%		
2008	3,450	3.79	578	623	26.1	91.4%			
2009	3,883	3.81	579	623	26.3	91.3%			
2010	3,520	3.84	588	627	26.8	93.0%			
2011	4,305	3.84	593	634	27.0				

* Cohort is based on the federal Student Right-to-Know Act, which defines an entering cohort as first-time freshmen who entered in Fall term or the immediately preceding Summer term who were enrolled full-time in the Fall term. In addition, students who died or left for military service are allowable exclusions; therefore, persistence rates are calculated on a revised cohort that may be slightly lower than the original cohort.

Figure 2.3: Cal Poly Six-Year Graduation Rate Trends

College by Ethnic Origin (part 1 of 2)

Less than 65.0% | 65.0% - 69.9% | 70.0% - 74.9% | 75.0% and Above

original cohort size listed under grad rate percentage

* includes: black, native american, NR alien, unknown

		Cohort Matriculation Term				
		Fall 1999	Fall 2000	Fall 2001	Fall 2002	Fall 2003
All Students	Hispanic	56.8% 234	60.5% 309	55.7% 366	61.4% 241	60.3% 257
	Asian	67.5% 302	65.7% 347	68.2% 447	74.1% 344	71.9% 349
	White	70.6% 1,299	71.4% 2,109	71.3% 2,433	74.4% 2,053	76.1% 2,053
	Other*	72.8% 1,013	64.1% 482	69.0% 384	69.7% 439	71.7% 350
	Total	69.9% 2,848	68.6% 3,247	69.1% 3,630	72.7% 3,077	73.8% 3,009
CAFES	Hispanic	38.5% 39	64.6% 65	47.6% 63	61.8% 55	64.1% 39
	Asian	69.6% 23	44.0% 25	64.3% 42	64.4% 45	72.4% 29
	White	66.6% 311	63.3% 474	67.2% 525	72.6% 485	75.9% 502
	Other*	68.4% 206	51.0% 104	60.8% 79	65.9% 91	65.2% 66
	Total	65.5% 579	60.8% 668	64.6% 709	70.3% 676	73.9% 636
CAED	Hispanic	44.1% 34	48.4% 31	56.9% 51	48.6% 35	61.0% 41
	Asian	72.0% 25	66.7% 33	68.0% 50	78.1% 32	71.2% 52
	White	59.0% 100	66.7% 192	61.9% 202	75.4% 203	70.8% 192
	Other*	66.0% 94	58.8% 51	68.8% 32	72.1% 43	80.6% 31
	Total	60.9% 253	63.5% 307	62.7% 335	72.2% 313	70.6% 316
CENG	Hispanic	49.2% 59	47.0% 100	34.0% 100	50.0% 54	49.5% 93
	Asian	59.6% 136	64.8% 193	62.6% 195	69.1% 165	64.2% 148
	White	55.6% 216	62.3% 491	60.6% 568	66.7% 501	67.2% 470
	Other*	68.2% 245	57.7% 130	64.1% 92	64.2% 120	55.3% 94
	Total	60.5% 656	60.5% 914	58.5% 955	65.7% 840	63.2% 805

Figure 2.3: Cal Poly Six-Year Graduation Rate Trends

College by Ethnic Origin (part 2 of 2)

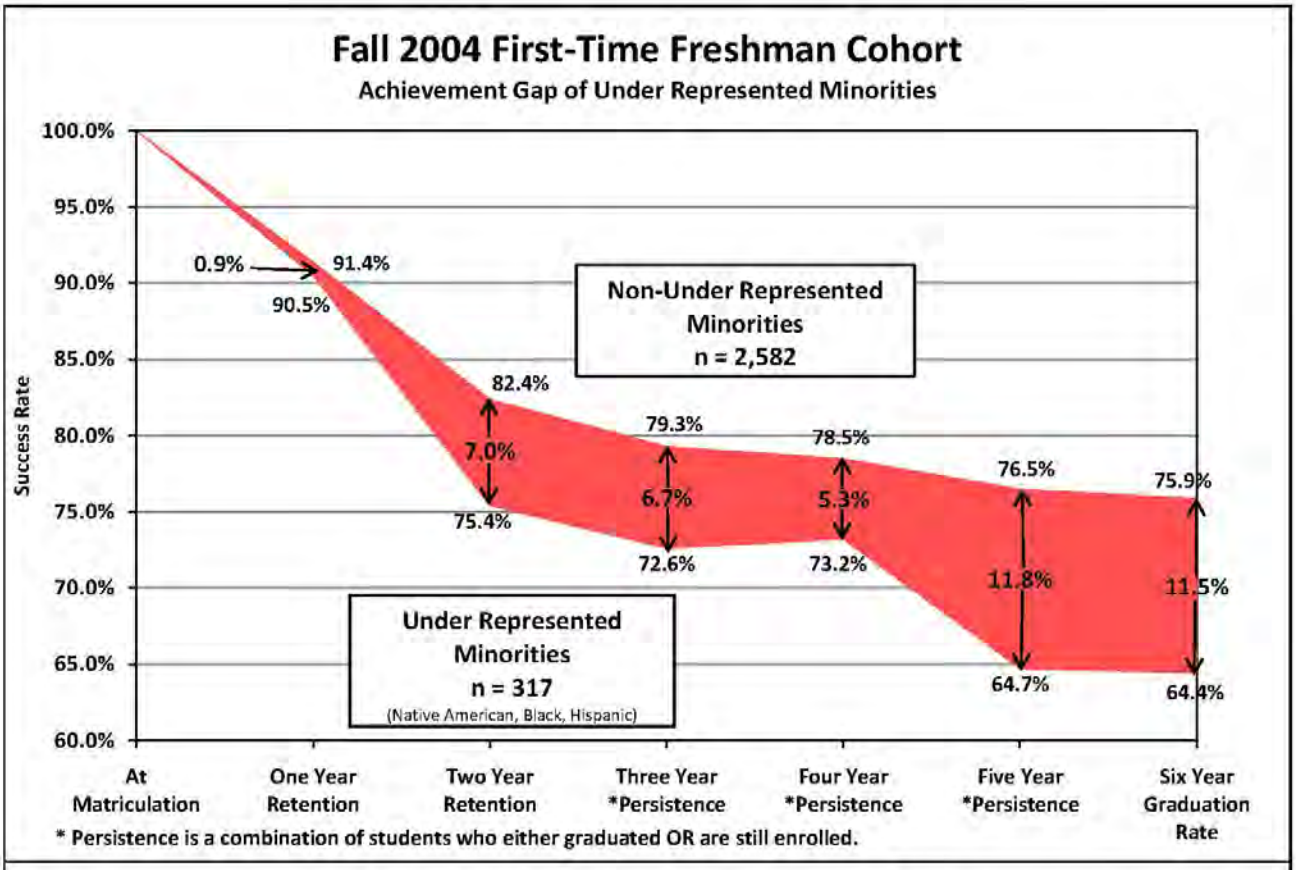
Less than 65.0% | 65.0% - 69.9% | 70.0% - 74.9% | 75.0% and Above

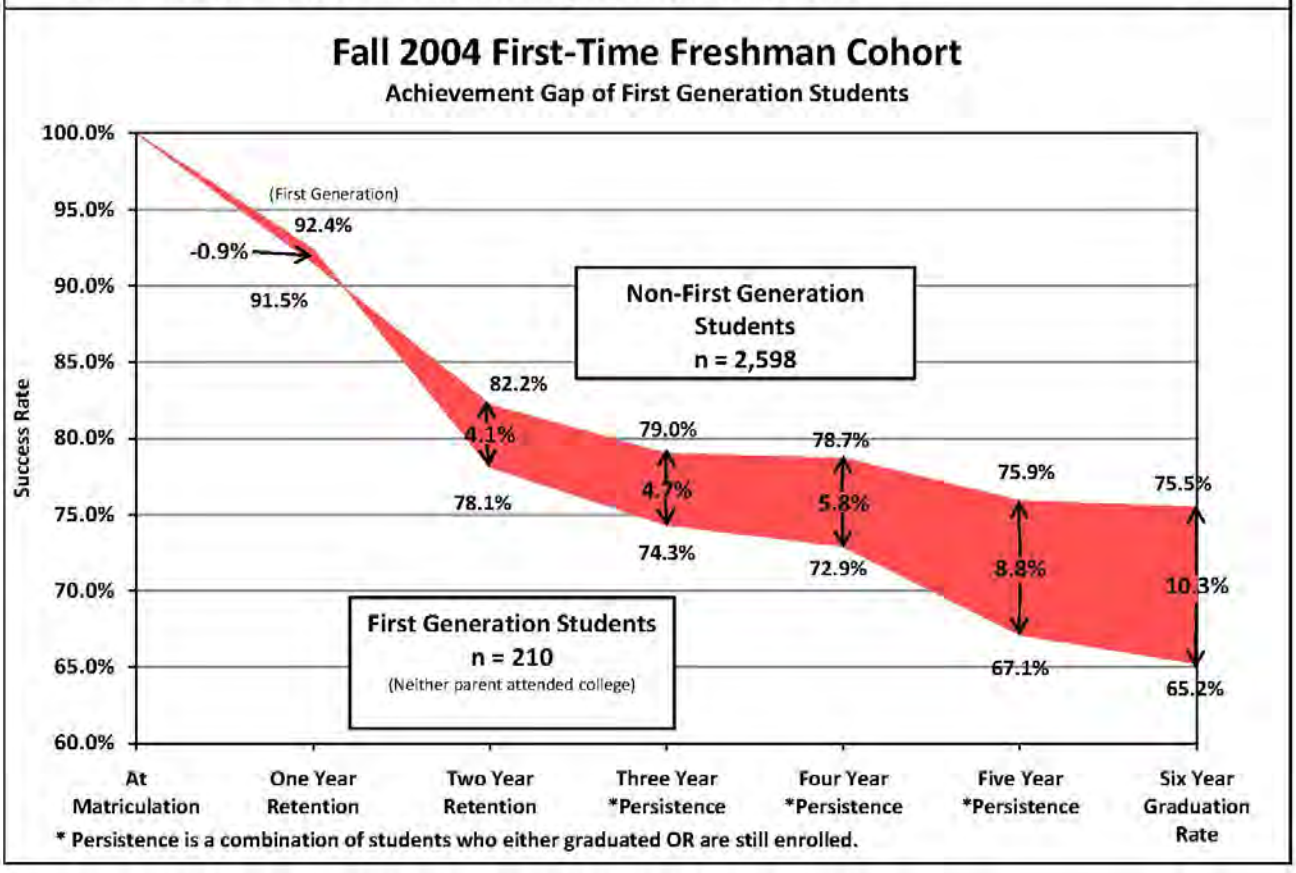
original cohort size listed under grad rate percentage

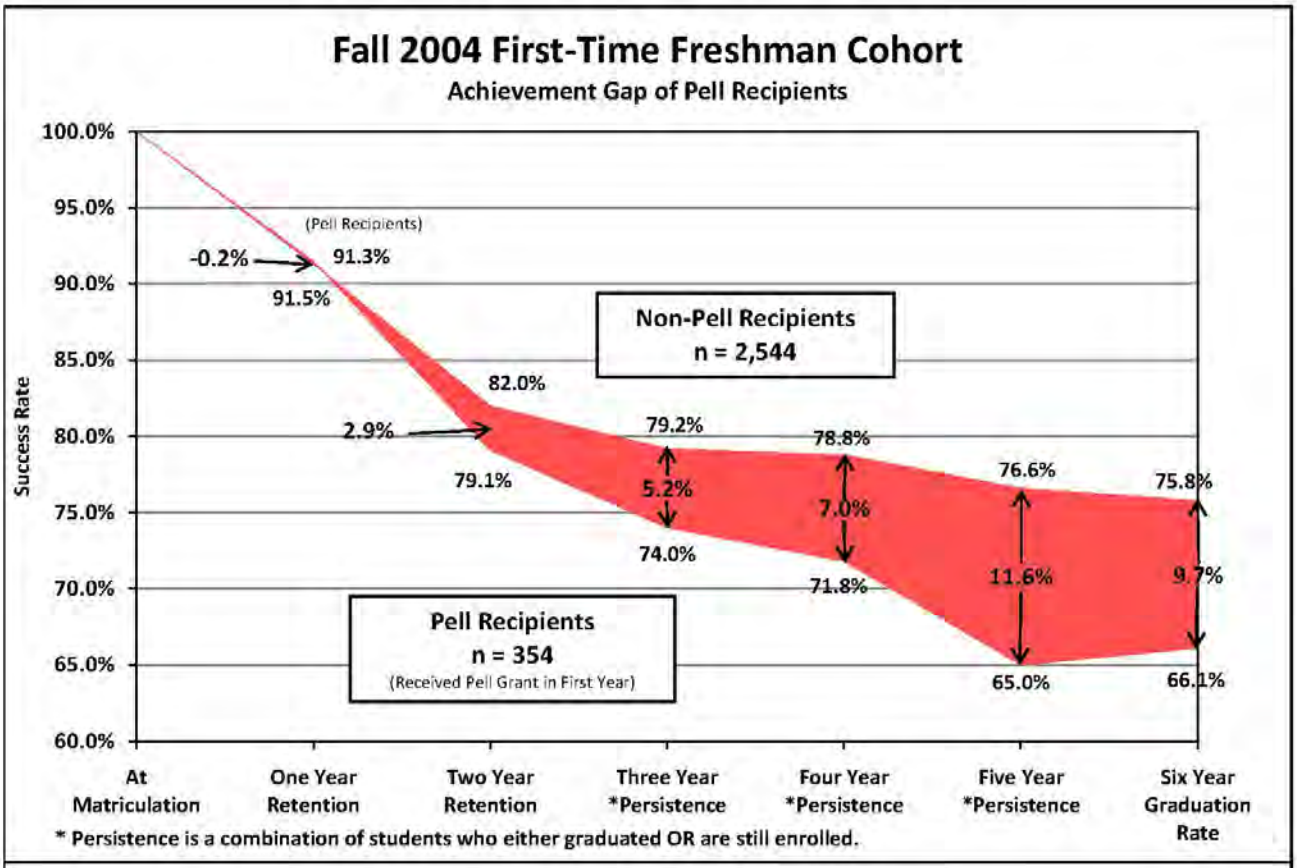
* includes: black, native american, NR alien, unknown

		Cohort Matriculation Term				
		Fall 1999	Fall 2000	Fall 2001	Fall 2002	Fall 2003
All Students	Hispanic	56.8% 234	60.5% 309	55.7% 366	61.4% 241	60.3% 257
	Asian	67.5% 302	65.7% 347	68.2% 447	74.1% 344	71.9% 349
	White	70.6% 1,299	71.4% 2,109	71.3% 2,433	74.4% 2,053	76.1% 2,053
	Other*	72.8% 1,013	64.1% 482	69.0% 384	69.7% 439	71.7% 350
	Total	69.9% 2,848	68.6% 3,247	69.1% 3,630	72.7% 3,077	73.8% 3,009
CLA	Hispanic	76.2% 42	76.1% 46	68.8% 77	75.6% 41	73.3% 30
	Asian	72.5% 40	64.3% 28	75.0% 40	86.4% 22	85.3% 34
	White	77.2% 285	81.0% 337	81.0% 427	81.8% 297	86.1% 296
	Other*	77.4% 186	72.5% 80	78.6% 70	76.9% 78	87.3% 55
	Total	76.9% 553	78.2% 491	78.8% 614	80.6% 438	85.3% 415
OCOB	Hispanic	77.4% 31	85.7% 35	83.3% 36	77.8% 27	85.2% 27
	Asian	80.7% 57	86.4% 44	82.2% 73	85.4% 48	88.5% 52
	White	87.5% 232	87.9% 323	84.0% 388	85.4% 309	86.1% 324
	Other*	89.4% 160	83.3% 66	87.3% 55	81.0% 63	86.3% 51
	Total	86.7% 480	87.0% 468	84.1% 552	84.3% 447	86.3% 454
CSM	Hispanic	62.1% 29	56.3% 32	71.8% 39	62.1% 29	50.0% 26
	Asian	66.7% 21	58.3% 24	68.1% 47	84.4% 32	67.6% 34
	White	69.7% 155	73.3% 292	74.3% 323	70.4% 257	72.9% 269
	Other*	65.6% 122	74.5% 51	58.9% 56	61.4% 44	73.6% 53
	Total	67.3% 327	71.2% 399	71.6% 465	69.9% 362	70.9% 382

Figure 2.4: Graduation Rate Achievement Gaps for Disadvantaged Students






Fall 2004 First-Time Freshman Cohort
Achievement Gap of Pell Recipients
Success Rate
100.0%
95.0%
90.0%
85.0%
80.0%
75.0%
70.0%
65.0%
60.0%
(Pell Recipients)
-0.2%
91.3%
91.5%
82.0%
2.9%
79.2%
79.1%
5.2%
78.8%
7.0%
76.6%
75.8%
74.0%
71.8%
11.6%
9.7%
65.0%
66.1%
Non-Pell Recipients
n = 2,544
Pell Recipients
n = 354
(Received Pell Grant in First Year)
At Matriculation
One Year Retention
Two Year Retention
Three Year *Persistence
Four Year *Persistence
Five Year *Persistence
Six Year Graduation Rate
* Persistence is a combination of students who either graduated OR are still enrolled.

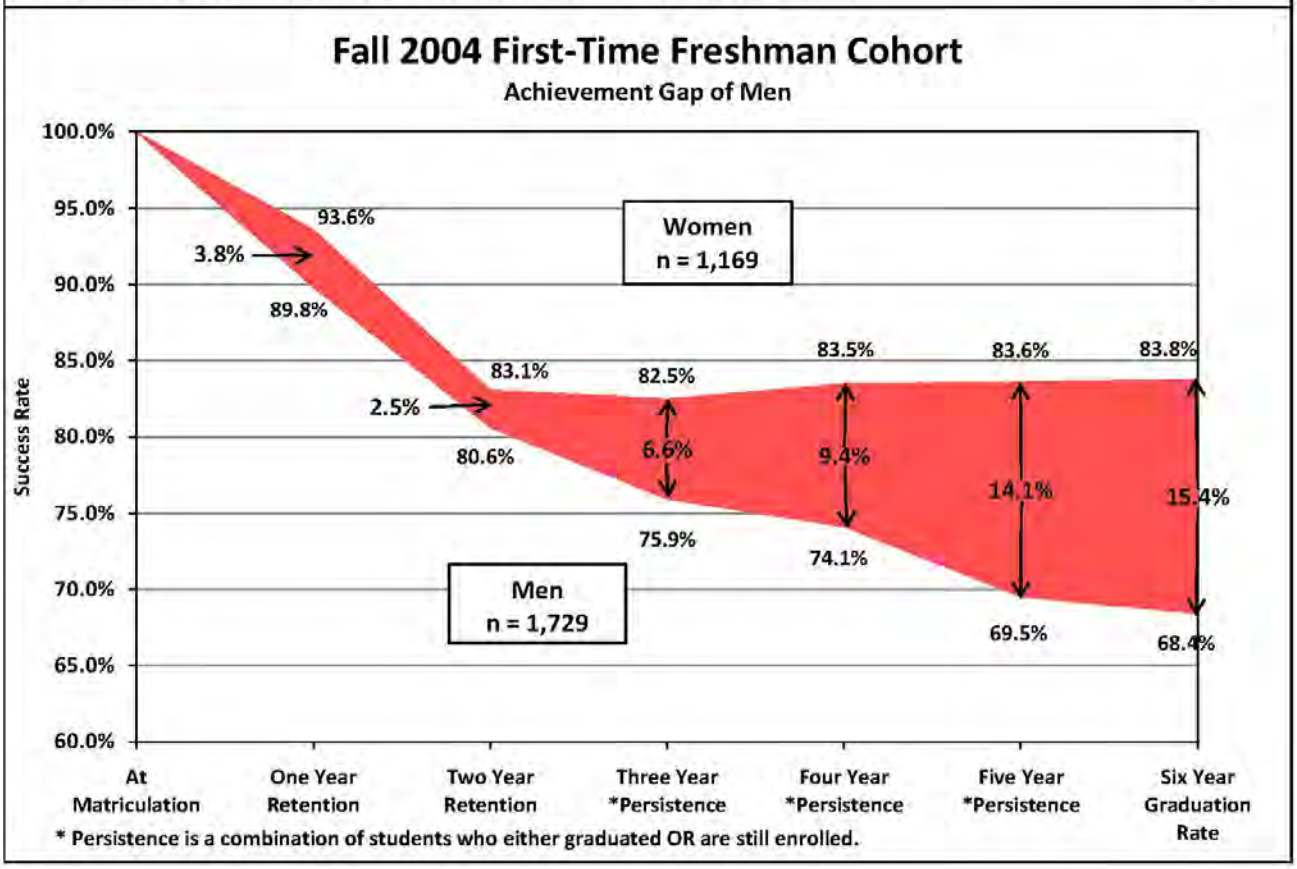

Fall 2004 First-Time Freshman Cohort
Achievement Gap of Men
Success Rate
100.0%
95.0%
90.0%
85.0%
80.0%
75.0%
70.0%
65.0%
60.0%
93.6%
3.8%
89.8%
83.1%
82.5%
83.5%
83.6%
83.8%
2.5%
80.6%
6.6%
9.4%
14.1%
15.4%
75.9%
74.1%
69.5%
68.4%
Women
n = 1,169
Men
n = 1,729
At Matriculation
One Year Retention
Two Year Retention
Three Year *Persistence
Four Year *Persistence
Five Year *Persistence
Six Year Graduation Rate
* Persistence is a combination of students who either graduated OR are still enrolled.

Figure 2.5: Fail and D/W/F Rates in Civil and Mechanical Engineering Courses

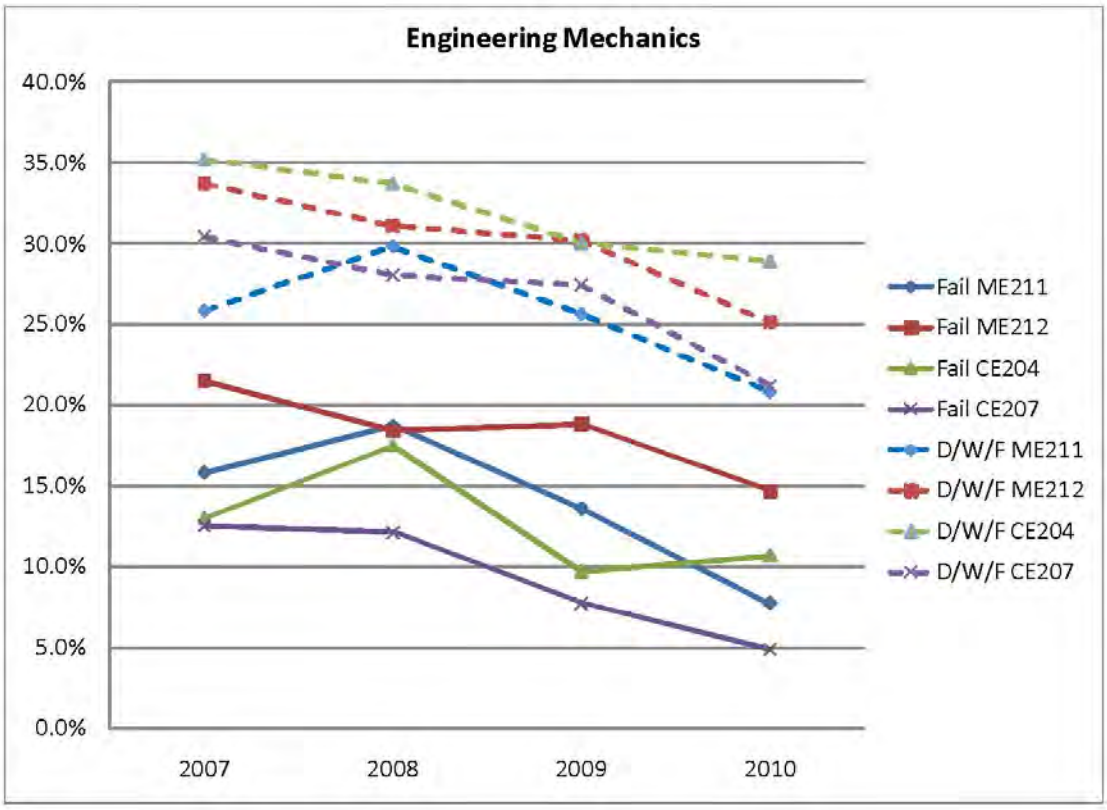


Figure 2.6: Cal Poly Total Student Enrollment Profile

Students	Fall 2006		Fall 2007		Fall 2008		Fall 2009		Fall 2010		Fall 2011	
Total Enrolled	18722		19777		19471		19325		18360		18762	
URMs*	2261	12.1%	2510	12.7%	2567	13.2%	2559	13.2%	2433	13.3%	2645	14.1%

*URMs = Hispanic/Latino, African American, and Native American. In Fall 2009 Cal Poly started reporting ethnic origin according to the new federal OMB standards. Caution should be exercised in making comparisons with previous years.

Figure 2.7: Fall 2011 First-Time Freshman and Transfer Yields by Ethnicity

Cohort	Total	African American	Hispanic	Native American	White
First-Time Freshman	37.4%	27.8%	30.9%	34.8%	41.3%
Transfer	53.3%	54.5%	56.0%	50.0%	58.8%

Organizational Learning

Figure 3.1: Program Learning Outcome Development

University Totals by Academic Year	Total Programs	Programs Reporting	Percentage of Programs Reporting	Has dept. developed program learning outcomes (PLOs)?				
				Yes	Yes, Under Revision	Under Development	Yes / Under Revision / Under Development	No
AY 2006-07	**87**	**87**	**100%**	69%	7%	22%	98%	2%
AY 2007-08	**87**	**86**	**99%**	73%	5%	21%	99%	3%
AY 2008-09	**89**	**83**	**93%**	86%	6%	11%	102%	5%
AY 2009-10	**90**	**63**	**70%**	71%	8%	8%	87%	13%
AY 2010-11	**92**	**84**	**91%**	69%	5%	12%	86%	14%

Figure 3.2: Alignment of Program Learning Outcomes

University Totals by Academic Year	PLOs aligned with accreditation standards / requirements?			PLOs aligned with college LOs (CLO)?			PLOs aligned with University Learning Objectives?		Course Learning Outcomes (CLOs) aligned with PLOs?			Dept. requires CLOs stated in syllabus?	
	Yes	No	Does not apply	Yes	No	Does not apply	Yes	No	Yes	No	Does not apply	Yes	No
AY 2006-07													
AY 2007-08	30%	5%	28%	38%	9%	14%	34%	28%					
AY 2008-09	49%	5%	48%	71%	16%	14%	75%	25%					
AY 2009-10	52%	5%	43%				66%	20%	81%	6%	13%	35%	65%
AY 2010-11	50%	8%	42%				86%	14%	77%	11%	12%	40%	60%

Figure 3.3: Publication of Program Learning Outcomes

University Totals by Academic Year	Total Programs	Programs Reporting	Percentage of Programs Reporting	Where are PLOs published?							
				Course syllabi: ALL	Course syllabi: SOME	Course Syllabi: ALL and SOME	Catalog	Department web page	Internal dept. docs	New course/curriculum proposals	Other
AY 2006-07	**87**	**87**	**100%**	14%	34%	48%	17%	18%			57%
AY 2007-08	**87**	**86**	**99%**	10%	37%	48%	29%	22%	37%	23%	45%
AY 2008-09	**89**	**83**	**93%**	30%	43%	73%	30%	42%	76%	54%	41%
AY 2009-10	**90**	**63**	**70%**	13%	37%	50%	13%	37%	70%	37%	27%
AY 2010-11	**92**	**84**	**91%**	14%	37%	51%	27%	38%	64%	32%	18%

Figure 3.4: Evidence Used to Determine Graduates Have Achieved Program Learning Outcomes

University Totals by Academic Year	Total Programs	Programs Reporting	Percentage of Programs Reporting	Other than GPA, what kind of evidence is used to demonstrate that graduates have achieved program outcomes?																			
				Capstone Courses	Senior Project	Public Performance/Exhibit	Embedded Questions	Comprehensive Exam	Portfolio Review	Student Surveys	Alumni Surveys	Employer Surveys	Licensure Exam Pass Rates	Student focus Groups	Student Interviews	Case Studies	Placement Rates	Graduate Thesis	Graduate Project	Exit Interviews	Peer Assessment of Work	Co-op/Internship Review	Advisory Board Feedback	Other
AY 2006-07	87	87	100%	46%	59%	11%	33%	24%	6%	62%	69%	44%	20%	3%	28%	2%	31%	20%	21%					24%
AY 2007-08	87	86	99%	52%	69%	14%	40%	30%	8%	62%	52%	40%	26%	3%	19%	3%	31%	22%	21%	12%	7%	19%	27%	20%
AY 2008-09	89	83	93%	69%	69%	28%	49%	37%	8%	69%	60%	43%	20%	8%	27%	4%	39%	22%	19%	29%	12%	18%	46%	28%
AY 2009-10	90	63	70%	59%	71%	27%	35%	38%	13%	60%	46%	37%	8%	10%	16%	13%	13%	25%	21%	14%	3%	13%	43%	25%
AY 2010-11	92	84	91%	54%	69%	19%	25%	35%	5%	56%	55%	39%	15%	10%	25%	5%	15%	20%	15%	19%	5%	24%	42%	8%

Figure 3.5: Interpretation of Evidence of Program Learning Outcome Attainment

University Totals by Academic Year	Total Programs	Programs Reporting	Percentage of Programs Reporting	Who interprets the evidence for the purpose of program improvement?														Dept developed a plan to assess student learning for all PLOs in one cycle of program review?			
				Dept Faculty Assigned to Assess.	Entire Department Faculty	Dept Assessment Committee	Dept Curriculum Committee	Dept Chair/Head	College Assessment Committee	College Curriculum Committee	College Staff	Academic Senate Curric. Comm.	Dean	Associate Dean	Univ Academic Assess Council	College Administrators	Univ Administrator(s)	Provost	Vice Provost	Other	Yes	Yes, under revision	Under development	Yes / Under revision / Under Development	No
AY 2006-07	87	87	100%	55%	71%	34%	37%	63%	25%	13%	3%	3%			11%	28%	16%			24%	37%	3%	39%	79%	20%
AY 2007-08	87	86	99%	59%	64%	49%	51%	67%	41%	13%	3%	5%			20%	29%	14%			17%	23%	6%	23%	52%	17%
AY 2008-09	89	83	93%	77%	81%	57%	59%	86%	58%	16%	8%	11%			13%	42%	28%			20%	52%	10%	33%	94%	17%
AY 2009-10	90	63	70%	62%	60%	49%	40%	70%	24%	8%	2%	3%	21%	25%						21%	32%	25%	38%	95%	5%
AY 2010-11	92	84	91%	51%	61%	36%	36%	76%	18%	13%	8%	6%	13%	24%	1%			0%	4%	23%	15%	29%	48%	92%	8%

Figure 3.6: Use of Program Assessment Findings

University Totals by Academic Year	Total Programs	Programs Reporting	Percentage of Programs Reporting	How are the program assessment findings used?								
				Improve Assessment Methods	Improve Curriculum	Examine Curric. Content	Examine Skill Development in Curric.	Promote Changes in Pedagogy	Stimulate Faculty Discussion	Re-Examine Program Outcomes	Engage Students	Other
AY 2006-07	**87**	**87**	**100 %**	66 %	69 %	67 %	56 %	49 %	70 %	59 %		
AY 2007-08	**87**	**86**	**99%**	70 %	79 %	70 %	63 %	55 %	64 %	60 %	27 %	
AY 2008-09	**89**	**83**	**93%**	82 %	88 %	81 %	80 %	61 %	84 %	78 %	43 %	
AY 2009-10	**90**	**63**	**70%**	65 %	78 %	67 %	65 %	49 %	76 %	46 %	22 %	21 %
AY 2010-11	**92**	**84**	**91%**	61 %	80 %	65 %	62 %	42 %	73 %	50 %	26 %	11 %

Figure 3.7: Integration of Student Learning Assessment into Program Review

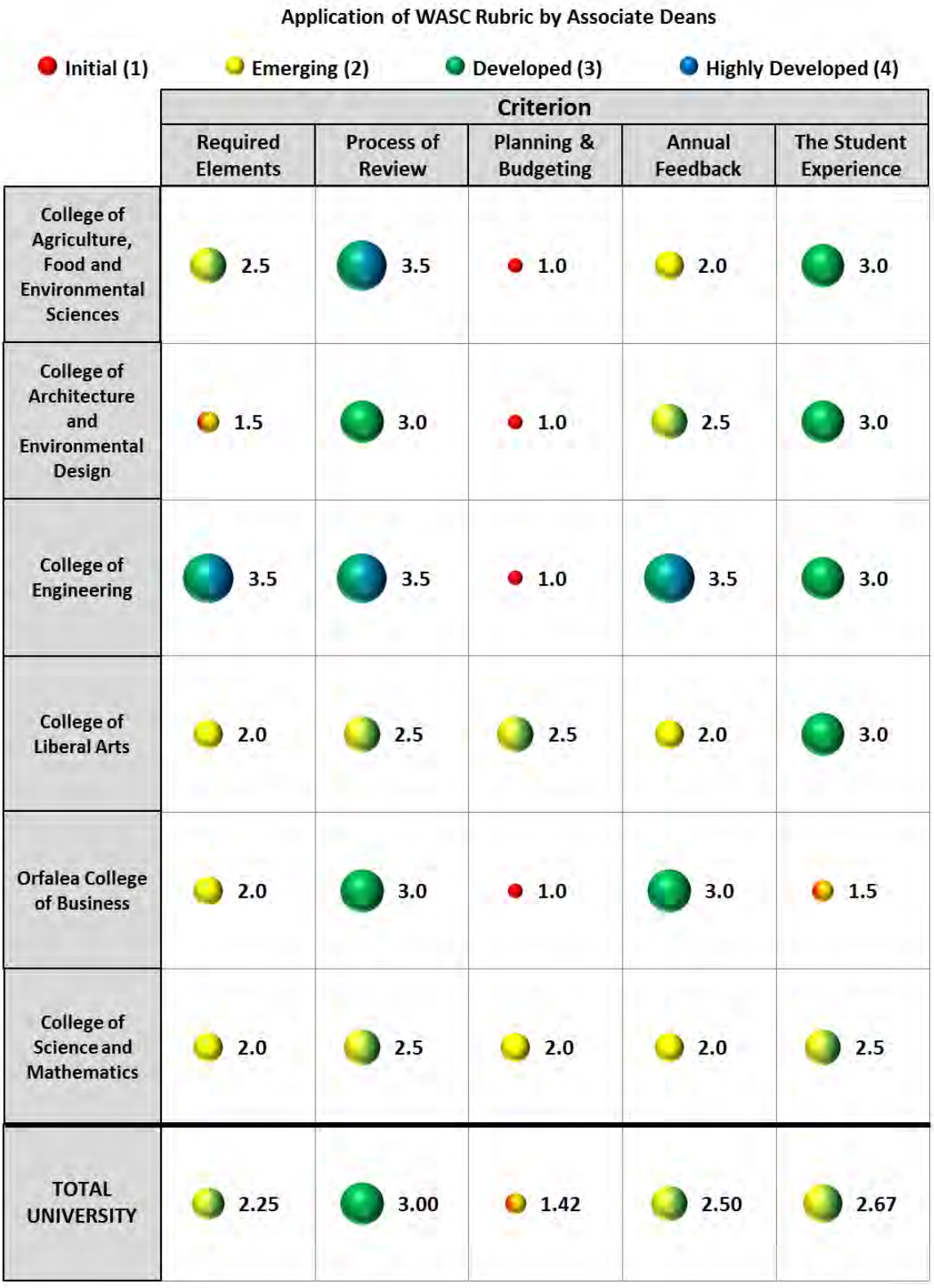
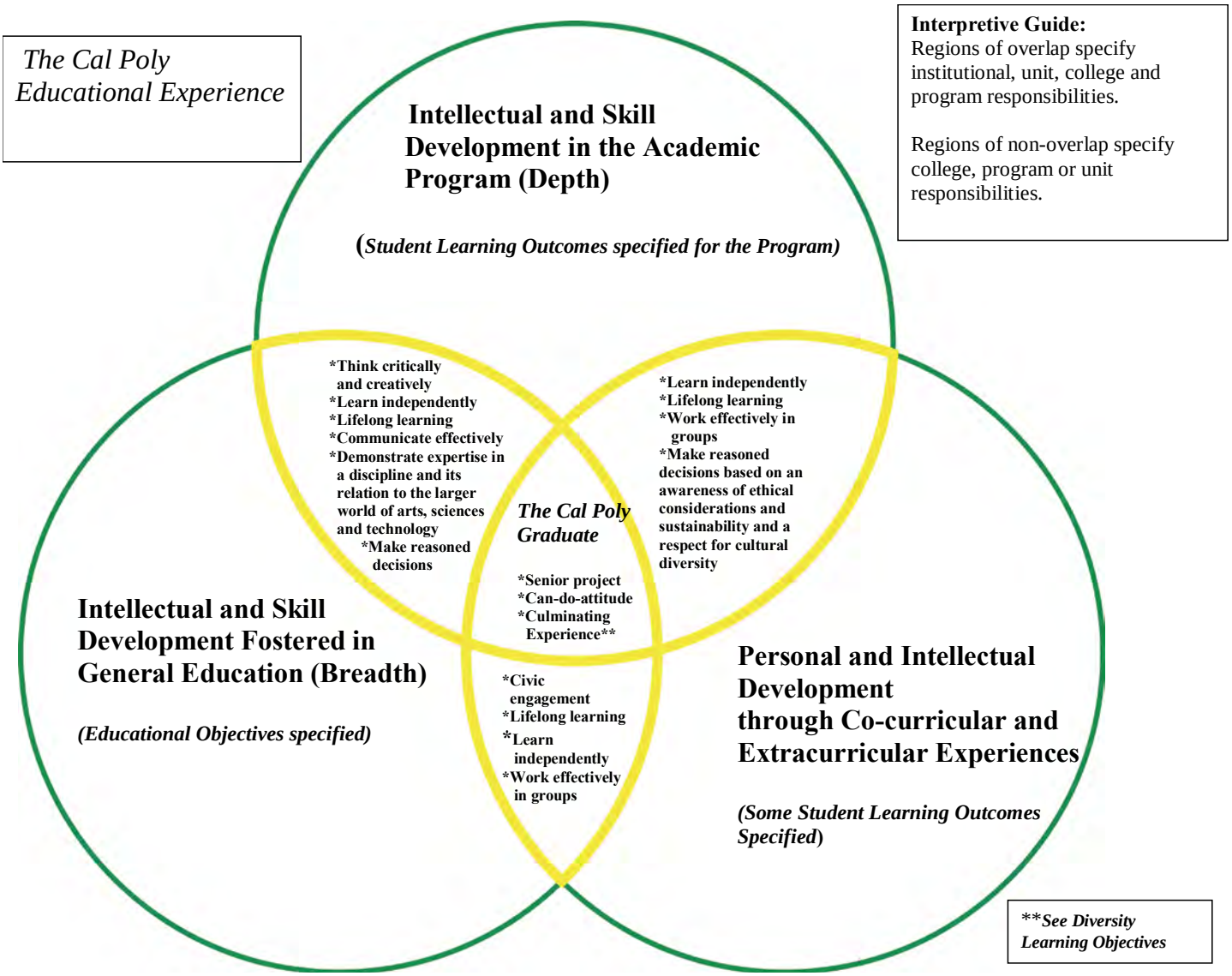


Figure 4.1: Venn Diagram of Where Student Learning Takes Place



Notes

Student Learning

[i] The ULO Project on Writing was not designed to measure changes in student attainment compared to pre-Cal Poly skill levels. The assessment of first and last essays in English 134 discussed later in the chapter follows a pre- and post-test method.

[ii] Two scores were excluded from later analyses because the college was not identified on the essay.

[iii] For a list, see Cal Poly, Academic Programs, "*Accreditation and Program Review Schedule by Cycle*," revised November 21, 2011.

[iv] One program reported that it required not a senior project but a capstone experience, indicating some confusion about the intended nature of the senior project.

[v] George D. Kuh, *High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter* (Washington DC: AAC&U, 2008), 17.

[vi] Kuh, *High-Impact Educational Practices*, Appendix A, 23.

[vii] Kuh, *High-Impact Educational Practices*, 14-18.

[viii] References to the senior project in the action items should be understood to include equivalent capstone experiences where the program makes a distinction between the two.

Student Success

[i] In the Speakout survey, half of the students received the questionnaire before a major bias incident on campus and half after, suggesting the need for caution in interpreting the results.

Organizational Learning

[i] CSU *Executive Order 1033* and Doug Keesey, "*GE/ULO Summary*," 2.

[ii] Because some programs occasionally reported multiple concentrations and specializations, Institutional Planning and Analysis collapsed the results to produce a single measure. Institutional Planning and Analysis did not include the responses of credential programs in the results.

[iii] A number of questions had ambiguous or inappropriate options; the wording improved over time, but a shortage of hands and a concern for the integrity of data has prevented any fundamental rethinking of the instrument. Furthermore, the language of the survey was not completely meaningful for Student Affairs, which participated only in 2008-09.

[iv]The number of responses varies from question to question because, at the beginning, when the survey was form-based, it was not possible to require a response and, toward the end, when the survey went online, a response was not required.

[v] There could be a problem with the sample, which declined over time, or with the question. The answers were ambiguous, and, although respondents were supposed to choose just one, the answers added up in two years to more than 100%.

[vi] This was the question in 2009-11. The question in 2007-09 was "Does the program have an assessment plan to collect data for all program learning goals in one program-review cycle?"

[vii] AS-383-92/EX *Resolution on Academic Program Reviews*.

[viii] The committee was first known as the interim Academic Program Review Committee and then as the Program Review and Improvements Committee (PRIC). Under the heading of "Evidence of Successful Program Completion," the guidelines asked programs to address issues of student success, but, curiously, had little to say about the issue of student learning beyond suggesting that programs provide "evidence of use of senior project as a learning tool" and survey alumni on the "adequacy of knowledge acquired for entry level jobs."

[ix] AS-552-00/IALA *Resolution on Academic Program Review*, lines 37-38.

[x] AS-460-96/PRAIC *Resolution on External Review*, page 1; AS-497-98/PRAIC *Resolution to Approve Procedures for External Program Review*. The PRIC remained in place and issued its last report in 1999-2000.

[xi] AS-552-00/IALA *Resolution on Academic Program Review*, lines 17-18.

[xii] "A program review process exists, but deans do not seem to be part of the review. An academic review process that occurs outside the purview of deans is inadequate in helping to improve the university," 2000 WASC Team Report.

[xiii] *Kaizen* is a Japanese term for continuous improvement.

[xiv] AS-718-10 *Resolution on Modification to Academic Program Review Procedures*, lines 25-26.

Our Polytechnic Identity

[i] *CPR Visiting Team Report*, 31.

[ii] Diana Middleton, "*Cream of the Crop*," *Wall Street Journal*, September 13, 2010; "Cal Poly Business, Engineering Grads Best in the Nation, According to Wall Street Journal," excerpted from *Wall Street Journal*, October 12, 2010; "Cal Poly Grads, Alumni Earn Top Starting, Mid-Career Salaries," excerpted from *San Jose Mercury News*, November 14, 2010.

[iii] Kuh, *High-Impact Educational Practices*, 19.

[iv] *Capacity and Preparatory Review Report* , 19-20.

[v] CPR report, 19.

[vi] *College of Science and Mathematics Personnel Policies, Procedures and Evaluation Criteria*.

[vii] See for example "Harvard Faculty Adopts Open-Access Requirement," *Chronicle of Higher Education*, February 12, 2008; also San Jose State University, SS-S10-2 *Sense of the Senate Resolution, Support for Open Access to Scholarly Work and Research*. For a complete list of universities with institutional open access mandates, see *Registry of Open Access Repositories Mandatory Archiving Policies*.

[viii] Kuh, *High-Impact Educational Practices*, 10.

[ix] Though the exercise attempted to determine GE's influence on how major programs mapped their PLOs, the question was poorly understood and will be revised in the future.