



Our Polytechnic Identity in the 21st Century

WASC Capacity and Preparatory Review Report

California Polytechnic State University, San Luis Obispo

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Introduction

In choosing to focus this self-study on “Our Polytechnic Identity in the Twenty-First Century,” we at Cal Poly have chosen to interrogate the kind of institution we are now and what we aspire to be, as well as whether our current resources, structures, and processes facilitate movement between the two. This passage is not without its challenges, and as the self-study has progressed it has become more and more clear that its themes address conflicts deeply embedded within our identity, conflicts that demand to be resolved if we are to achieve our potential as a comprehensive polytechnic university.

Following the acceptance of our [institutional proposal](#) in December 2007, President Warren Baker appointed a widely representative [WASC Steering Committee](#) charged with overseeing the self-study. The committee was co-chaired by David Conn, WASC ALO and Vice Provost for Academic Programs and Undergraduate Education, and Bruno Giberti, Professor of Architecture. The steering committee commissioned [four working groups](#), one to study each of the [four themes](#) outlined in the institutional proposal. Each group produced an essay, which was circulated for campus comment as detailed in [Appendix I](#).

The steering committee helped the working groups stay focused on the research questions, methods, and outcomes outlined in the proposal, in the belief that this was the best approach for an inquiry-based assessment of our institutional capacity. This approach had the added benefit of framing the self-study not as an exercise in compliance but as an intellectual opportunity to apply the tools of scholarship to the study of our institution. The steering committee then coordinated the essays with the Criteria for Review (CFRs), both throughout the report and in a complete map in [Appendix E](#).

Two innovative campus surveys, the [Cal Poly Student Survey](#) ([Appendix L](#)) and the [Cal Poly Faculty/Staff Survey](#), ([Appendix M](#)) were developed as part of the self-study. These were rigorous exercises, inspired by the National Survey of Student Engagement and prepared with the help of a Chancellor’s Office expert in continuous improvement; the instruments are included in the preliminary reports, linked above. Once again, the surveys stayed close to the institutional proposal; every question was submitted to the double test of knowing that it served a clear purpose and that it could produce a usable result. Primary among them was the seemingly simple “Where do students learn?” This question was originally proposed in response to one particular essay, but it came to have a broad applicability within the self-study. We tried to answer it by probing the relationship between Cal Poly’s [University Learning Objectives](#), the [Diversity Learning Objectives](#), and a list of venues or locations where learning could be expected to take place; the actual questions were revised on the basis of pre-testing in focus groups. The response was respectable; the pool was considered to be representative; and the results provided a significant evidentiary basis for the essays that the self-study continues to mine.¹

All four working groups remained faithful to the original proposal, especially to the study questions, which are included as subheads in the text of each thematic essay. “**Our Polytechnic Identity**” aspires to be a visionary document that directly addresses the issue of our institutional character while considering best peers and practices as well as the challenges and opportunities facing this university. “**Learn-by-Doing**” investigates our signature pedagogy in a systematic way; it describes what learn-by-doing has been at Cal Poly, what it is now, and what it should be, putting forth, perhaps for the first time, a necessary working definition. “**The Teacher-Scholar Model**” also proposes a working definition; it examines an area of transition, one that has been a source of some anxiety for Cal Poly, an institution historically focused on teaching. The essay attempts to chart a forward course that respects and enlarges an honorable tradition to include a growing emphasis on all forms of scholarship that have the capacity to promote student learning.

Our last theme, “**Integration & Student Learning**,” began as “The Integrated Educational Experience,” but this came to be seen as a clumsy formulation of a critical concept: the need to “just connect” the disparate pieces of a student’s education, whether they occur in the major, in GE, in the co-curriculum, or at work. Integration was the second theme in the original proposal, but the current order has come to seem more meaningful:

- Learn-by-doing is our institutional brand and our pedagogical foundation.
- The teacher-scholar model is an overlay that deepens expertise and contributes to student learning.
- The quest for integration is a logical response to the concern for developing transferable skills and a meaningful reply to the fractured nature of higher education, riven as it is by bureaucratic and disciplinary divides.

These are three essential aspects of our polytechnic identity, which binds and brings them together. Our identity is significantly modified by a fourth aspect, embodied by the development of vigorous programs in the arts, sciences, and humanities. These help to make Cal Poly a *comprehensive* polytechnic university.

Although the four essays are presented separately, they have gradually come to inform each other as our understanding of the issues has become deeper and our perspectives have become more integrated. The co-curriculum, which looms large for Integration and Student Learning, makes a significant appearance in Learn-by-Doing. This pedagogy has in turn been particularly relevant to The Teacher-Scholar Model. As might be expected, Our Polytechnic Identity is an umbrella that addresses the concerns of the other three themes. All four essays consider diversity in its various forms.

This report is, of course, the product of a multi-year study, and the state in which we find ourselves now is not the state in which the working groups first began their investigations. Along with the other CSU campuses and most institutions of higher education, Cal Poly currently faces an extremely challenging financial situation. Our operating budget for 2009-2010 reflects a fifteen percent reduction from the previous fiscal year, which deepens and extends a long-term trend of declining state support. While such cuts have an impact on our institutional capacity, they do not diminish our core commitments to either capacity or educational effectiveness, although they may delay the initiation of some of the bolder proposals made by the working groups. A frank discussion in the steering committee about the appropriateness of these proposals in the current environment led to the heartening consensus that, to be credible, the proposals needed to be made in the full, glaring recognition of our difficult situation. It also led to the affirming position that a self-study, like a strategic plan, is more than ever necessary in times of financial crisis as it helps to crystallize what is most important to the institution. This knowledge can then be used to effectively allocate scarce resources.

Our original expectation was that the university's new strategic plan would be completed before the initiation of the self-study. That process did not happen as planned, and we found ourselves developing them both at the same time. The last draft of the plan and the first draft of this report were simultaneously released to the campus and its stakeholders. However, what was originally a source of concern – two processes that appeared to compete like trains on parallel tracks – gradually became a source of strength. The two were consciously integrated, with the Vice Provost for Strategic Initiatives and Planning sitting on the WASC Steering Committee and the two chairs of the steering committee contributing to the Strategic Planning Writing Team. This interlacing of individuals allowed the issues of the self-study to infiltrate the strategic plan, while some of the most basic elements of the strategic plan—the establishment of an appropriate peer group and the creation of a dashboard with an appropriate set of indicators—found their place in this report and helped to complete it. All of us who have worked on the report hope that it will be, for the campus, a compelling argument for institutional improvement and, for the visiting team, a convincing demonstration of our capacity and our ability to complete the second stage of our self-study.

Overarching Theme: Our Polytechnic Identity

How should Cal Poly build on its 20th-century heritage as a highly rated, comprehensive, master's-degree-granting, polytechnic university to best respond to the challenges and opportunities of the 21st century?

Abstract

This essay begins by observing that Cal Poly's unique mix of majors, combining aspects of traditional polytechnic, land-grant, and comprehensive universities, makes it difficult to identify an appropriate set of peers. The essay proceeds by considering a selection of best practices associated with fifteen institutions. Though none are, individually, directly comparable to Cal Poly, together they demonstrate both the attitudes we must emulate and the actions we must take to become an outstanding polytechnic in the 21st century, which the essay describes in an extended statement. Reviewing our current capacity to achieve this vision yields mixed results; most notably, the group concludes that Cal Poly has lacked the “institutional agility” that would help it meet four basic challenges:

- Move Cal Poly into the ranks of outstanding polytechnic universities.
- Ensure that all graduates are whole-system thinkers with integrated and interdisciplinary strength across all university disciplines.
- Empower graduates to be leaders in their chosen fields.
- Enhance campus diversity and increase student, faculty, and staff awareness and understanding of diversity.

Who should we consider to be our peer and aspirational institutions?

Identifying a set of peers has always been a challenge for Cal Poly because we find ourselves in a unique position of strength in terms of programs and reputation. We are part of the California State University (CSU) system, yet we compete for undergraduates with UC Berkeley, UC Davis, and the University of Southern California. Unlike the UC campuses, we do not offer a PhD and, as investigated in the Teacher-Scholar Model essay, we have a different balance between teaching and scholarship. Because we offer a range of majors associated not only with polytechnic institutions but also with land-grant and comprehensive universities, no single set of peers provides an adequate comparison for all aspects of our identity.

To address this complexity, the working group searched widely for best practices and sought to cover the mix of majors offered at Cal Poly. Early in the process, the group identified fifteen schools that included polytechnic and land-grant universities as well as some acknowledged flagship institutions: Arizona State University, Franklin Olin College, Georgia Institute of Technology, Illinois Institute of Technology, Iowa State University, MIT, Michigan Technological University, Missouri University of Science and Technology, Rensselaer Polytechnic Institute, Rochester Institute of Technology, San Diego State University, Texas A&M University, University of Delaware, University of Wisconsin at Stout, and Virginia Tech. Some were chosen for their similarities to Cal Poly; others, often nationally recognized universities, were chosen for qualities that we might aspire to emulate.¹

In considering these peer and aspirational institutions, the working group tried to answer the following questions: Which schools already exemplify the qualities of an outstanding polytechnic university? How do their curricular and co-curricular activities reflect their mission and vision statements? Are there best practices that we should emulate? The group found that many of these institutions are improving undergraduate education by establishing multi-disciplinary programs, integrating sustainability into the curriculum and co-curriculum, proactively enhancing campus diversity, and promoting what the group came to describe as *institutional agility*. A few examples of these practices include:

- An emphasis on integrated, interdisciplinary, and multi-disciplinary learning:
Rochester Institute of Technology has restructured every major by [requiring all students to declare a liberal arts concentration or minor](#). The university no longer treats general education (GE) as a discrete segment of students' academic experience but instead integrates GE into a seamless web of educational activities.

Iowa State University has created [*learning communities*](#) where students live and take classes together to create a shared experience.

The University of Delaware is implementing a comprehensive, project-based-learning curriculum. The university has [*embedded critical thinking into all general education classes*](#) and made a commitment to undergraduate research activities. Remarkably, [*50% of the students study abroad*](#) as part of their undergraduate experience.

- An understanding of social and environmental impacts:

Rochester Institute of Technology houses the [*Golisano Institute for Sustainability*](#), a “team of tenure[d] and tenure-track faculty, research faculty, engineers, technicians, project managers, and students all dedicated to an interdisciplinary approach to achieving sustainable production systems.” The university also offers engineering programs that examine the environmental and societal impacts of engineering design and decisions.

The University of Delaware uses its farm as a [*working laboratory for sustainable, environmentally friendly agriculture*](#). They have been awarded numerous grants.

- The inclusion of diversity and global perspectives:

Michigan Technological University, in collaboration with the Peace Corps, has initiated the nation’s first [*Peace Core Master’s International program in mechanical engineering*](#). The university’s [*Diversity Framework*](#) has a multi-stage action plan that includes metrics and achievements.

San Diego State University [*is tenth in the nation for bachelor’s degrees awarded to Hispanics and sixteenth for bachelor’s degrees awarded to ethnic minorities*](#). The university partners with local schools to help students from diverse backgrounds prepare for higher education.

The University of Delaware in its [*Blueprint for Diversity*](#) states the following: “To prepare students for citizenship in the multicultural, multiracial society of the 21st century ... requires diligence and persistence in promoting a diverse campus climate; creating a diverse staff, faculty and student body; ... ensuring that students are educated with diversity as the core of the University’s mission; and ascertaining that the University is organized to meet these multifaceted needs.”²

- An administration that supports and rewards innovation and institutional agility:

Rochester Institute of Technology includes the following as part of its [*mission statement*](#): “We rigorously pursue new and emerging career areas. We develop and deliver curricula and advance scholarship relevant to emerging technologies and social conditions.”

Franklin Olin College has made a commitment to innovation and continuous improvement as part of its educational mission and has established an [*Office of Innovation and Research*](#).

Arizona State University has developed a [*new model for the American research university*](#), creating an institution that is committed to excellence, access, and impact. “Unlike many of our peers,” states the university, “we have also undertaken a massive reorganization of our institution. We have torn down walls between disciplines and encouraged collaboration among diverse units. We have altered the trajectory of the university and reevaluated the role that universities play in society, in the economy, and in education.... By breaking the mold, ASU has become a place where local solutions have global impact.”

Though none of these institutions are, individually, directly comparable to Cal Poly, the working group believes that collectively they demonstrate both the attitudes we must emulate and the actions we must take if we want to become an outstanding polytechnic in the 21st century. The group identified two basic approaches that underlie many of the practices cited above.

First, outstanding polytechnics represent themselves as comprehensive universities regardless of their history. Cal Poly began in 1901 as a state vocational high school; we have come a long way since then and yet, despite what our [mission statement](#) might say, we continue to view “polytechnic” and “comprehensive” as competing rather than complementary aspects of our identity. This limited vision causes us to spend inordinate time and energy on an unnecessary dispute between advocates of depth in the major and breadth in GE. CFR 1.1

Second, outstanding polytechnics are thoroughly engaged with the world; they look outward as they make plans and take innovative actions. Regardless of their current ranking, they recognize that the status quo will not guarantee future success. As noted in the Integration and Student Learning report, Cal Poly’s tendency has been to look inward, to form a self image that is not rigorously assessed against external standards. One of our challenges, discussed later in this report, is to emulate our peers by establishing stronger ties to the academic world and to our community. 4.4

What should be the characteristics of Cal Poly as a 21st-century, comprehensive, master’s-degree-granting, polytechnic university?

Based on this review of peer and aspirational institutions, on the results of the [Cal Poly Student](#) (Appendix L) and [Faculty/Staff Surveys](#) (Appendix M), and on personal knowledge of and experience with outstanding universities, polytechnic and otherwise, the working group arrived at the following statement:

An outstanding polytechnic university is a comprehensive institution of learning of the highest caliber. It offers the study of both professional subjects and the arts and sciences, cutting across academic disciplines in ways that are especially relevant to contemporary society and to meeting the challenges of the future. Being polytechnic, the university excels at the application of theory to practice in creative, meaningful, and important ways; it ensures that students, faculty, and staff members grow intellectually and continue developing the skills necessary to be responsible, productive, fulfilled citizens and leaders in their communities. Embracing a comprehensive educational mission, the outstanding polytechnic university provides sound visionary leadership on and off campus, solves complex problems in diverse contexts through technological expertise and innovation, and produces an enlightened environment of scholarly excellence and exchange.

Reviewing our current capacity to achieve this vision yields mixed results. In keeping with the above paragraph, the Cal Poly Mission Statement and new [Strategic Plan](#) both state that the institution is a comprehensive polytechnic university. We do “offer the study of both professional subjects and of the arts and sciences” that our dual identity would suggest, but we have also maintained a narrow definition of polytechnic that is almost entirely restricted to the fields of agriculture, architecture, and engineering, and we have maintained enrollment in these fields at around 70% of the total. The strategic plan suggests a broader approach based on the Carnegie Foundation’s definition of *professional fields* to include agriculture, architecture, engineering, business, graphic communication, education, information technology, natural resources management, and professional, career-focused programs in the arts and in the social and related behavioral sciences. With 74% of our bachelor’s degrees awarded in such professional fields, our Carnegie classification is *Professions Plus Arts and Sciences*, the same classification as most universities that consider themselves polytechnic. Our challenge, then, is to enlarge our concept of what it means to be polytechnic and thus end any lingering conflicts between colleges that are and colleges that are not traditionally considered part of that group.³ 1.1 4.1

In places, our curriculum and co-curriculum do “cut across academic disciplines in ways especially relevant to contemporary society and to meeting the challenges of the future,” but there is a lack of official structure to support these activities, as discussed by the strategic plan’s Interface Disciplines Working Group ([Appendix P](#)). Examples of current inter- or multi-disciplinary efforts include university-wide (UNIV) courses team-taught by faculty members from different departments, the recently established BA in Liberal Arts and Engineering Studies, and the engagement of students from many majors in clubs and organizations that compete in national competitions. Nevertheless, it is apparent that our prevailing campus culture is not currently one of “embracing a comprehensive educational mission.” 2.11

The next item in the statement, “the university excels at the application of theory to practice,” is the working group’s definition of what distinguishes Cal Poly as a polytechnic university. Not surprisingly, it is also the definition of a professional education. Some institutions emphasize theoretical studies; others produce graduates noted for their practical skills. Cal Poly—because of its predominantly professional fields of study, its comprehensive mix of majors, and the scholarship of its faculty—offers a fairly unique balance between theory and practice. This combination is further supported by the university’s long-time commitment to the pedagogy of learn-by-doing, which presumes that the deepest learning occurs when students are able to apply what they learn as ideas. The Learn-by-Doing essay examines our capacity to engage students in this way and finds that, while the pedagogy is practiced across campus, its value is unfortunately not recognized in all disciplines. This limited adoption of a signature practice may prevent us from seeing our polytechnic and comprehensive natures as mutually supportive. 2.5

Our capacity to “ensure that students, faculty, and staff members grow intellectually and continue developing the skills necessary to be responsible, productive, fulfilled citizens and leaders in their communities” is examined in the Integration and Student Learning essay, notably in its discussion of our insufficient awareness and appreciation of the co-curriculum and our lack of any real tracking of alumni after graduation. The latter leads to ignorance about whether we truly train our students to be leaders. It also makes it difficult to assess whether the University Learning Objective regarding lifelong learning is being met, although we are currently attempting an assessment of our students’ *preparedness*, at graduation, for lifelong learning. The Teacher-Scholar Model essay addresses the professional growth and development opportunities for our faculty and staff, as well as our capacity for “scholarly excellence and exchange.” The essay finds that a reasonably high level of scholarly engagement is nonetheless hampered by lack of support and by lack of a shared, comprehensive understanding of what scholarship means. 4.6 2.8

Finally, to “provide sound visionary leadership on and off campus” and “solve complex problems in diverse contexts through technological expertise and innovation,” we must adapt to an ever-changing global environment, develop novel solutions to contemporary issues, and prepare to address the challenges of the future. A commitment to diversity and sustainability is essential. This type of action also requires the university to develop an institutional agility that, at present, is largely lacking. This agility would result from our having the following characteristics: 1.3 3.8

- We foster an academic culture that values innovation, entrepreneurship, and lifelong learning.
- We are committed to continuous assessment and renewal.
- We remove self-imposed barriers and establish an administrative framework that supports flexibility and change.
- We emphasize interdisciplinary and multi-disciplinary approaches to problems.
- We reward excellence and innovation.

Many of the actions needed to acquire or strengthen these characteristics are already spelled out in the strategic plan or implied by the [University Learning Objectives](#), [Diversity Learning Objectives](#), and [Sustainability Learning Objectives](#). Although a number of initiatives are underway to make these learning objectives an integral part of the university’s curriculum and culture, as reported in the Integration and Student Learning essay, the Cal Poly Student and Faculty/Staff Surveys suggest that awareness of the objectives could still be improved.⁴ 1.2

What are the distinguishing challenges/opportunities of being a highly rated, comprehensive, master’s-degree-granting, polytechnic university?

The working group identified four over-arching challenges, presented here with suggested actions to help us address these challenges. These actions are based on the group’s review of peer institutions and its knowledge of highly rated universities. In some cases, the foundations for moving forward have already been laid, as detailed below.

Challenge 1: Move Cal Poly into the ranks of outstanding polytechnic universities.

As noted above, the working group believes that outstanding polytechnic universities look outward and are engaged with the world. For Cal Poly to move into their ranks, we need to be more engaged with the academic world by, for example, hiring world-class scholars to fill endowed chairs, establishing a visiting scholars program to bring leading scholars to campus for extended visits, increasing the number of faculty members taking sabbatical leaves to engage 2.8

in scholarly activity at other institutions, and expanding collaboration with leading educational institutions and private entities. The group believes that taking such actions, which are all common at outstanding universities, would help to elevate Cal Poly's standing.

At the same time, we need to be more engaged with our local community. Students, faculty, and staff members, through classes and co-curricular activities, already contribute to the development of sustainable environments throughout San Luis Obispo County by providing expertise and hands-on assistance with building design, energy issues, transportation needs, agricultural projects, and social services. Furthermore, the first building in a "[University-Related Technology Park](#)" is currently under construction, with a scheduled completion date of May 2010. The Tech Park, situated on campus, will provide an incubator for innovative businesses that leverage work done at the university. This initiative exemplifies how the institution could grow as an intellectual and economic development engine for the community. The working group believes that there is the potential for more of this kind of activity.

Meeting this first challenge will require new resources, financial and otherwise. Majors traditionally associated with a polytechnic university are costly in terms of the laboratories, equipment, and infrastructure needed to support a world-class institution. Cal Poly's emphasis on learn-by-doing experiences across the curriculum and co-curriculum adds another layer of costs. Reductions in state support over the past several decades have strained the university's ability to maintain its distinctive polytechnic and learn-by-doing qualities and characteristics. As just one infrastructure example, Cal Poly currently spends less than \$1.7 million per year, or \$285 per FTE student, on the library resources needed to support scholarly and creative activity. Libraries at peer institutions identified in Cal Poly's draft strategic plan and this self-study spend a median of \$669 per FTE.⁵ 3.6

It is unlikely that the state will provide this support, so our ability to carry out the necessary actions will require widening the financial base of the university by increasing donor contributions and the number of externally funded projects. Increasing grant funding is one possible approach. According to the Teacher-Scholar Model report, Cal Poly ranks in the middle of the CSU when it comes to grant funding, and we do not compare well with the schools identified as part of our peer group, although we recognize that—unlike Cal Poly—the latter are mostly research institutions. The disparity is significant because grants not only fund scholarly activity but also provide overhead that can support the infrastructure needed by an excellent university. 3.5

In addition, private donations to ongoing programs and projects, such as student research, and to the university endowment both need to increase substantially if we are to realize our potential. Our first capital campaign, launched in 2001, raised \$40 million more than its initial target of \$225 million, and another campaign is currently planned to begin in summer 2010 with the tentative goal of \$400-\$500 million.

In 1996 the university launched the Cal Poly Plan to help preserve and strengthen educational quality, expand access to classes, shorten time to degree, and provide the support needed for a comprehensive polytechnic university that was no longer recognized in the state funding formula. Over the years, students have repeatedly expressed their support for the Cal Poly Plan and today contribute over \$16 million in the form of campus academic fees. In a recent referendum, Cal Poly students again demonstrated their willingness to support educational excellence by voting to increase the academic fees. This important fact should be publicized to all potential donors, including foundations, corporations, and individuals. However, at the request of the CSU Chancellor, the imposition of a Cal Poly-specific fee increase has been placed on hold for the indefinite future.

Challenge 2: Ensure that all graduates are whole-system thinkers with integrated and interdisciplinary strength across all university disciplines. 2.2, 2.3 2.4, 2.5 2.6

Echoing the strategic plan, President Warren Baker has declared that "All majors at Cal Poly are polytechnic." This assertion suggests that all our majors should be engaged in the application of theory to practice, which is this essay's working definition of what distinguishes Cal Poly as a polytechnic institution. To validate this statement throughout our comprehensive suite of degree programs, we must ensure that the arts, humanities, and social sciences are woven more effectively and meaningfully into the curricula of all science, technology, engineering, and mathematics 1.1

(STEM) programs, as they are at Rochester Institute of Technology. At the same time, because we are a polytechnic university, students in the arts, humanities, and social sciences need a stronger grounding in science and mathematics and need to spend more time and effort engaging important questions about the role of science and technology in our global society.

Meeting this second challenge requires a stronger emphasis on integrated, interdisciplinary education aimed at developing students who are what the strategic plan calls whole-system thinkers. Multidisciplinary curricula, course clusters, and integrative activities can all contribute to this goal, especially those emphasizing sustainability, critical thinking, global awareness, and cultural diversity. In addition, success requires sufficient curriculum flexibility for students to take these courses and a reward structure that encourages faculty members to develop and teach them.

Much of what needs to be done can be accomplished by rethinking our curriculum, especially GE and its connection to major programs. GE is a critical, integrative component of a university education, but to some extent our current curricular structure places it in competition with the traditional polytechnic majors for both financial resources and course units. How do we value and reward programs that are sometimes viewed as “merely” providing support courses? How do we tame the curricular demands of the majors? These are unresolved issues at Cal Poly, but we could benefit from looking outward to find successful models at our peer institutions. As a start, Provost Robert Koob has declared 2009-10 to be “the year of the curriculum” and asked the Academic Senate to exercise its authority over the curriculum by considering ways to achieve a more effective partnership between GE and the major programs. 3.11

However, the problem is larger than the distinction between GE and the majors. To educate whole-system thinkers, we need to break down the “silo” mentality that is so prevalent on campus; this is a 20th-century attitude that will prevent us from reaching our full potential in the 21st. To be an outstanding polytechnic, we must think about more than our units because our graduates will need that broader view. To be successful professionals, our graduates must be able to change roles and jobs every few years, integrate knowledge from many disciplines, and work with diverse groups of people on complex, open-ended problems that lack neat, textbook solutions. Our present curriculum does not support this mode of thinking and acting, although the working group noted that the barriers are frequently imposed by the faculty rather than the administration. For example, it is the Academic Senate that has adopted many of the convoluted curriculum rules and procedures that inhibit institutional agility. 3.11

In addition, the working group questioned whether our long-standing practice of requiring students to declare a major upon matriculation is an asset or a liability. It is asserted that students entering majors are more likely to succeed because they have, from the start, an academic home and a clear path to graduation, although data on time to graduation and on how many students change (or would like to change) majors, calls this view into question. A positive feature of this policy, noted in the Learn-By-Doing essay, is that students get early learn-by-doing experience by enrolling in major courses during their freshman year. However, this practice may contribute to the prevailing silo mentality in two ways. First, tying students’ identities so closely to their majors is one reason GE and interdisciplinary courses are sometimes devalued in the curriculum. Second, an over-emphasis on majors, coupled with a budgetary model based largely on numbers of full-time-equivalent students, encourages departments and colleges to compete for individual bodies and the resources they represent rather than to cooperate in furthering the best interest of all our students. This practice needs a thorough re-examination.

Ultimately, the working group believes that our ability to meet this second challenge depends more on our institutional practices than on our financial resources. Success requires a commitment to the full spectrum of courses and majors of a comprehensive university and to the interdisciplinary and integrative experiences our graduates need to succeed in the future. It also requires continuous evaluation and improvement. Simply put, it requires institutional agility. The institution must possess the capability to respond quickly to emerging societal needs, to flexibly reform and modify the curriculum, and to nimbly move in new educational directions when opportunities arise. As noted above, many of the present barriers to agility are self-imposed; removing them will require a conscious effort on all our parts to change the campus culture. Until now, for example, the review and updating of our curricula have been tied to a two-year catalog publication cycle. Under limited circumstances, we have recently started to review 3.8

individual course proposals on a continuous basis and are considering a more flexible process for the review of more substantial changes in the curriculum.

Challenge 3: Empower graduates to be leaders in their chosen fields.

Cal Poly graduates are known for their hands-on skills. They need to be equally sought after for their vision, critical-thinking skills, and ability to work well with others. These skills will allow our graduates to become recognized leaders in their chosen fields.

Leaders understand the social dynamics of working with others; they have good organizational abilities; and they thrive on ill-defined, open-ended challenges; these are teachable skills. UC Davis's [Center for Leadership Learning](#), for example, offers students for-credit opportunities to work in small groups with faculty members to develop these skills. At Cal Poly, our silo mentality and heavy emphasis on content knowledge in the major largely preclude teaching leadership skills in the formal academic curriculum, although the co-curriculum offers a number of informal opportunities for leadership development, e.g. leadership roles in ASI government, Open House, WOW, and student clubs and organizations.

Leadership training requires providing students with opportunities, both in and out of the classroom, to make decisions, experience the consequences, and then reflect on the experience with faculty members and other students. An over-prescribed educational environment with few choices, in which students are treated more as children than adults, is not conducive to producing leaders.

At the same time, students must learn to collaborate and work successfully as members of a team. Leadership skills and collaboration skills are complementary, and a good leader is also a valued team member. One way to help students develop leadership and collaboration skills would be to encourage more team-based, multi-disciplinary projects with the goal of finding and evaluating possible solutions to complex, open-ended problems. Students would have to cooperate, but each would also have to take a leadership role for some aspect of the project. Cal Poly's successful [Solar Decathlon team](#) is a good example.

Our best and brightest students are the most likely to become leaders, and they need to be given every opportunity to succeed. Most highly rated universities have a strong and visible honors program and a formal program for undergraduate research. They also provide opportunities for students to interact with faculty members and high-level administrators outside the classroom and to meet and exchange ideas with prominent visitors. These types of experiences encourage students to attain goals they might have thought beyond their reach.

Cal Poly does have an honors program and other activities for students who excel; the honors program is currently under review by a task force of the Academic Senate, but the working group suggests that such programs need to be expanded and showcased to give students the skills and confidence they need to succeed on a world stage. Some new resources and administrative oversight are needed to meet the challenge of producing future leaders, but the key is changing the campus culture to more visibly and consistently honor excellence and reward leadership.

Challenge 4: Enhance campus diversity and increase student, faculty, and staff awareness and understanding of diversity.

1.5

If our students are to be successful as citizens and workers, they must be prepared to live and work in an increasingly diverse world, which is one of the principles underlying the [Inclusive Excellence model](#) championed by the Association of American Colleges and Universities. The model, based also on the principle that a university must be inclusive in order to be excellent, is now being pursued at Cal Poly. It is discussed further in the essay on Integration and Student Learning.

An impediment to the implementation of Inclusive Excellence is the fact that, despite some improvement, the students, staff, and faculty of Cal Poly do not adequately reflect California's diversity. Within the limits of what is legally permissible, we have engaged in repeated efforts over the years to change this reality, but success has been

limited for a variety of reasons. Not the least of these is the dearth of underrepresented students leaving high school in California who are interested in pursuing higher education, especially in STEM fields, and qualified for admission to Cal Poly. Another reason is our relative isolation, which presents an obstacle to less affluent students who wish to commute to college from home rather than pay for accommodation on or close to campus. Nevertheless, the working group considers it desirable to increase such efforts as the “Partners’ Program,” which seeks to grow the number of first-generation students we admit.

Going hand in hand with this effort, we need to seek greater retention and success by improving the support of all students, especially those from underrepresented groups who often face extraordinary challenges due, for example, to their high schools offering only limited curricular and co-curricular options. If students do not feel supported when they arrive at Cal Poly, their academic achievement is at risk. Programs such as Connections for Academic Success, which offers guidance directed at students admitted through the Partners’ Program, provide some capacity in this area. More programs are identified in the essay on Integration and Student Learning; however, this essay also contains findings about campus climate that suggest that our current level of support is inadequate. In addition, in order for all students to have available role models and mentors, we need an increased commitment to diversity in faculty and staff hiring.

On campus, the study and appreciation of language, culture, and diversity need to be valued and made more prominent in the curriculum and co-curriculum; in this regard, it should be noted that GE does not now grant credit for the study of foreign languages, although students may transfer such credit from community colleges. Instead of marginalizing such subjects as support courses or compartmentalizing them in the US Cultural Pluralism requirement, they need to be engaged by the major curriculum in order to demonstrate that they are valued.

Cal Poly has been recognized for the relatively high number of students who participate in international study; the absolute number, however, is still small and indicates an area ripe for improvement.⁶ We should be increasing the number of students who participate in such programs, which would expose them to the wider world; a similar end would be met by increasing the number of international students attending Cal Poly.

If we can meet these four challenges, we have the opportunity to create an outstanding, comprehensive polytechnic university. We will then note with pride that

- Our graduates are ready to tackle the 21st-century challenge of building a sustainable world by utilizing both technical knowledge and an acute understanding of human, economic, and global issues.
- Our graduates are prominent leaders in their professions, sought out not only for their hands-on skills but also for their innovation and critical-thinking skills.
- Our faculty members are acknowledged experts in their fields, regardless of whether they conduct cutting-edge research, consult for innovative start-up businesses, or engage with the community.
- Our campus community and campus culture reflect and affirm the diversity of the state of California.

Theme 1: Learn-by-Doing

What is currently meant by learn-by-doing and what should it be?

Abstract.

The results of multiple campus surveys suggest that Cal Poly needs a working definition of learn-by-doing that is specific enough to be meaningful and inclusive enough to account for the disciplinary variety of a comprehensive polytechnic university; the multiple curricular, co-curricular, and extra-curricular venues in which students learn; and the intellectual and practical aspects of higher education. This essay advances the hypothesis that, because of the “upside-down-curriculum,” learn-by-doing happens earlier and more often in a student’s career at Cal Poly than at comparable institutions. It observes that any area of the curriculum or co-curriculum that is not associated with a highly valued pedagogy such as learn-by-doing is necessarily undervalued; general education and diversity learning are such areas. The essay concludes that learn-by-doing is not a product; it is a deliberate, intellectual process whereby students, acting alone and in consort with others, gradually acquire essential knowledge and skills through active, self-reflexive engagement with the world inside the classroom and beyond it.

What are the historical and theoretical foundations of our learn-by-doing pedagogy?

Historical Foundations. With the California Assembly’s passage of the Enabling Act in 1901, San Luis Obispo became home to the state’s first Polytechnic School. Guided by the utilitarian ideas of John Dewey and other American “pragmatists,” the school’s founders stressed teaching the hand as well as the head. Cal Poly retained its signature, hands-on, learn-by-doing pedagogy even after its transformation into a comprehensive university offering undergraduate and graduate programs in technical and non-technical fields alike.¹

Over the course of Cal Poly’s long history, students, staff, faculty, and administrators have made surprisingly few attempts to define what learn-by-doing means for the entire campus community. One exception was the 1983 university mission statement, which addressed learn-by-doing obliquely by emphasizing work preparedness and some methods for achieving it: “internships, cooperative education, enterprise projects, and numerous co-curricular activities.”² Far more common are statements like the one that inaugurated the Centennial Campaign in 1996, in which learn-by-doing “defines our identity and charts our future” but remains a vaguely defined process that “actively engages students in their own learning ... from the first quarter of enrollment.”³ One need only look at the [University Advancement](#) websites that resulted from that campaign to see that active engagement means widely different things to different groups of people.⁴ In short, very little has been said in the past about Cal Poly’s signature pedagogy.

Theoretical Foundations. Theoretical Foundations At the heart of the polytechnic tradition is an insistence on the union of theory and practice with an emphasis on the latter, but a review of theoretical literature on learn-by-doing suggests that there is disagreement on not only how best to achieve such a union, but also what the result might be. For instance, biologist Jean Piaget posited a rather rigid model of gradual cognitive development (so-called “cognitive constructivism”) that rendered many types of experiential education futile until an individual reached psychological “maturity,” whereas Carl Rogers’ humanistic psychology tipped the balance in the opposite direction by postulating the primacy of direct experience and focused reflection in intellectual and psychological development. Similarly, while Rogers, Dewey, Paulo Freire, and others agree on the dialectical and potentially empowering nature of experiential education, Freire’s “critical transformative praxis” places much greater emphasis on eliminating the traditional hierarchical divide between teacher and student and on exposing what he describes as the inherently inequitable, political nature of reigning epistemologies ([Figure 1](#)).

Using these historical references and theoretical perspectives as a benchmark, the Learn-by-Doing Working Group set out to craft a definition of learn-by-doing that honors Cal Poly’s past while anticipating its future. To facilitate that process the group began to identify some of the most effective and innovative learn-by-doing practices on our campus.

How is learn-by-doing currently implemented in different programs/parts of the curriculum?

In attempting to identify what learn-by-doing currently looks like at Cal Poly, we have benefited from several important sources. The Spring 2009 Learn-by-Doing Department Chair/Head Survey, which was conducted as part of this self-study, asked respondents to rank twenty possible learn-by-doing practices with respect to their contribution to student learning. The results revealed a marked preference for tried-and-true methods such as the senior project (95% of respondents), collaborative work (90%), student research papers & projects (80%), and, finally, laboratories (70%). It is worth noting that the twenty-eight of forty respondents who selected laboratories unanimously ranked it as highly important to student learning.⁵

2.5

We have also availed ourselves of ongoing work on the [Cal Poly Strategic Plan](#), particularly the preliminary report of the interdisciplinary Project-Based Learning Group. The report explicitly acknowledges the need for a more precise definition of learn-by-doing that includes but is not limited to project-based learning; we affirm this distinction, as well as the report's conclusion that "project-based learning enhances learn-by-doing, where it is appropriate." The authors offer numerous, fairly detailed profiles of projects that permit students to apply theories or principles they learned in the classroom to produce work characteristic of professionals in their chosen disciplines—a key aspect of project-based learning according to the report. Among the numerous projects profiled are the College of Architecture and Environmental Design's "cold lab" design studios, in which students occupy their own individual workspaces for the duration of the quarter; the Music Department's production of operas in the Vocal Ensemble course; and museum displays designed by interdisciplinary teams of faculty and students in Design of Museum Displays on Science, Engineering, and Technology, an interdisciplinary, University Studies course.⁶

4.1

One way we may enlarge our understanding of learn-by-doing at Cal Poly is to cast a broader net and examine what members of the campus community are doing outside of the conventional classroom. On one version of the [Cal Poly Student Survey](#), 38.1% of respondents to a question on curricular activities indicated that they have participated in supplemental workshops in math and science, 30.8% in co-ops or internships, and 19.7% in study abroad programs. More to the point, 83.5% agreed or strongly agreed that this kind of experience will help them in their personal and professional lives.⁷

Equally impressive is the fact that 82.8% of respondents agreed or strongly agreed that co-curricular experiences will help them in their personal and professional lives. Significantly, 73.7% participated in clubs and organizations and 45.0% in orientation programs such as [Open House](#); [Summer Orientation, Advising, and Registration](#) (SOAR); and [Week of Welcome](#) (WOW).⁸ Such activities can offer significant encounters with learn-by-doing; the Cal Poly chapter of [Engineers Without Borders](#) is just one example of a student club that embraces the pedagogy by devising innovative projects at home (e.g., creek embankment stabilization in Poly Canyon) and abroad (e.g., water purification and sanitation in Mae Nahm Kuhn, Thailand).⁹ Cal Poly students have also inspired and continue to manage projects like Cal Poly's Organic Farm¹⁰ and *The Forum*, a historical journal of student research edited by students in History and designed and produced by their peers in Graphic Arts.¹¹

2.11

These and comparable undertakings demonstrate how Cal Poly students often take the lead in implementing and refining learn-by-doing activities in co-curricular settings. Such evidence of student learning beyond the regular classroom at Cal Poly is corroborated by results of the [National Survey of Student Engagement](#) (NSSE), which suggest that 66% of Cal Poly freshmen and seniors participate in such activities, most of them for 1-5 hours per week (34/32% respectively). These numbers are on par with our polytechnic and national peers; they are significantly higher than those for other CSU campuses that participated in NSSE.¹² The high concentration of learn-by-doing in the co-curriculum presents a perfect opportunity to forge the types of intentional connections discussed in the Integration and Student Learning essay, a factor we must keep in mind as we endeavor to define learn-by-doing for our campus community.

Is learn-by-doing different at Cal Poly than at other institutions?

Learn-by-doing, then, is widely implemented at Cal Poly, but is there anything unique in the way it is practiced here? One need only peruse the websites of other polytechnic institutions to see that it is not the learn-by-doing pedagogy itself, but the weight that Cal Poly attaches to it throughout a student's tenure here that is perhaps most distinctive.

Though any single example of learn-by-doing may not set Cal Poly apart from our peers, the wide range of learn-by-doing opportunities available, as mentioned above, may do so. In addition, the consistent application of theory to practice across the curriculum and co-curriculum may distinguish students' learning experiences here from what is taking place elsewhere. The preponderance of professional degree programs at Cal Poly combined with the unusual requirement that students declare a major upon matriculation should mean that these experiences start earlier and occur more frequently than they would at other institutions, even other polytechnics.¹³

The major-declaration requirement leads to freshman enrollment in major classes, which results in the so-called upside-down curriculum. This pattern is in stark contrast to most other universities, where freshmen and sophomores concentrate on satisfying a broad range of common core or general education requirements before delving too deeply into major courses. The requirement may have a significant impact on the student experience of learn-by-doing at Cal Poly; 91.9% of respondents to the student survey stated that courses in the major curriculum provide the most opportunities for learn-by-doing, which suggests that students do in fact encounter learn-by-doing much earlier at Cal Poly than at peer institutions. The more important question, however, is whether and to what extent this early exposure to learn-by-doing contributes to student success. The answer may well be that involvement in major, learn-by-doing coursework from day one at Cal Poly has a paradoxical effect, strengthening the resolve (and perhaps success) of students eager to immerse themselves in work that is most directly "relevant" to them while accelerating disillusionment with the major among individuals who might have gone several terms at another institution before enrolling in a major course.

There is reason to believe that a surprisingly high number of students are dissatisfied with their choice of major. On the Cal Poly Student Survey, 19.4% of respondents indicated that they have changed their majors since coming to Cal Poly; 23.6% would change their majors if they had the opportunity.¹⁴ This situation needs to be understood and addressed before our students can be expected to reap the full benefits of learn-by-doing. By consulting comparative data on changes of major for peer institutions and/or organizing focus groups for prospective, current, and former students during the EER phase of the self-study, we may be able to determine how learn-by-doing activities influence student decision making in this regard. Analysis of existing assessment data and qualitative comments on the student survey will also help us determine to what extent specific learn-by-doing approaches contribute to student success. 2.10

What impact does learn-by-doing have on student success after graduation?

Though anecdotal evidence abounds that employers prefer Cal Poly graduates because of their ability to "hit the ground running," we do not currently perform any comprehensive program of evaluation or tracking of alumni or their employers. Results of the 2008 NSSE do suggest that, when compared to their peers at other CSUs and polytechnic institutions, Cal Poly seniors leave here with a greater sense of having acquired the skills and knowledge directly relevant to their chosen career (means of 3.28/2.99/3.15, respectively; [Figure 2](#)).¹⁵ Alumni have reported similarly high levels of satisfaction with their Cal Poly degrees regardless of when they received them, but satisfaction is not the same as measurable success.¹⁶ In professional degree programs, completion of licensing exams and achievement of licensure may be used as direct evidence of lifelong learning; some departments conduct exit interviews with graduating seniors; and Career Services surveys employers for some but not for all colleges. None of the results are analyzed longitudinally nor do these instruments ask questions aimed specifically at learn-by-doing. Moreover, the current employer surveys are not applicable to all disciplines. If we are to understand the lasting impact of our pedagogy, Cal Poly needs to conduct these surveys more assiduously and with more emphasis placed on the long-term effects of learn-by-doing. 4.8

How can learn-by-doing be leveraged to assist in the recruitment and retention of students, faculty, and staff from underrepresented populations?

The Cal Poly Student Survey seems to suggest that learn-by-doing is an effective tool for recruitment and retention: 58.7% of respondents agreed or strongly agreed that it was important in choosing to attend Cal Poly, and an even greater percentage, 68.2%, agreed or strongly agreed that learn-by-doing met their expectations as a student.¹⁷ As the self-study proceeds, we will disaggregate the survey results by gender, ethnicity, and age to see whether or not this preliminary conclusion is accurate for all segments of the student population. 1.5, 2.10

The efficacy of learn-by-doing as a recruitment tool was further explored in Spring 2009 when students enrolled in Professor Stern Neill’s Listening to the Consumer course took on the pedagogy as their class project. One team specifically addressed current and future marketing of the learn-by-doing “brand” to prospective students and concluded that Cal Poly does enjoy a “competitive advantage” once people are aware of what learn-by-doing entails. They also underscored the need for a university-wide definition of learn-by-doing.¹⁸ But again, we will need to dig deeper to see whether or not these conclusions hold up with all populations and disciplines.

In contrast to these results, the Cal Poly Faculty/Staff Survey suggests that the university’s emphasis on learn-by-doing is less effective in attracting new hires. Only 37.9% of respondents agreed or strongly agreed that Cal Poly’s emphasis on learn-by-doing was important in their choosing to take their position, yet 60.1% of respondents agreed or strongly agreed that their experience of learn-by-doing has met their expectations.¹⁹ Again, this data will be examined more closely in the upcoming year to determine if this holds true for everyone, especially members of traditionally underrepresented groups.

As a sidebar, informal interviews with area teachers whose students participate in the College of Science and Mathematics’ learn-by-doing laboratories for junior high boys and girls provide additional, anecdotal evidence of just how appealing the learn-by-doing model is for educators serving in more diverse communities within San Luis Obispo County. As one science educator explains it, the experience is a “motivational” one for students who might not otherwise think about going to college, as the Cal Poly students who provide them with direct, “hands-on” opportunities to test scientific theories and principles serve as excellent “role models.” She also describes the experience as a “mutually beneficial” one for both groups of students, as it builds community and self confidence and may well inspire students’ interest in pursuing a career in science and/or teaching.²⁰

How can a campus-wide model of learn-by-doing contribute to student achievement of the University Learning Objectives?

Cal Poly survey results for all campus constituencies suggest that learn-by-doing experiences play a vital role in student achievement of the [University Learning Objectives](#) (ULOs). Students overwhelmingly credit courses in the major curriculum both with providing the most learn-by-doing opportunities, as previously stated, and with helping them learn all the skills addressed in the ULOs (from 71.5% for ethical understanding to 98.8% for disciplinary expertise) with one exception: the ability to make reasoned decisions based on an understanding of diversity (53.7%).²¹ Results of the faculty/staff survey corroborate the preeminence of the major curriculum in providing students with learn-by-doing opportunities (88.5%) yet hint at considerable variation in the ULOs that faculty and staff stress in their interactions with students. For instance, communicating effectively (81.9%) occupies pride of place in this context, whereas only 41.1% of faculty/staff respondents very often or always stress sustainability when working with students.²²

1.1, 2.2a
2.3, 2.4

As intimated above in the discussion of current learn-by-doing practices, the Cal Poly surveys also show some difference of opinion among campus constituencies as to where this kind of learning is taking place. For instance, faculty and staff attach much greater importance to the senior project (80.1%) as providing the most opportunities for learn-by-doing than students do (40.9%). Given the high percentage of student survey respondents who “don’t know” if the senior project will help them achieve the ULOs (typically around 60%), we may surmise that most students are not aware of the potential value and importance of this culminating experience, very likely because they have not yet attempted or completed it. If the senior project is to serve as an integrating, culminating, learn-by-doing experience for all Cal Poly graduates, then we may need to do a better job of articulating its importance early on in their academic careers. We could begin by developing a more articulate policy on the senior project.

The relationship between learn-by-doing and fulfillment of the university’s [Diversity Learning Objectives](#) (DLOs) warrants serious consideration by all campus constituencies. The DLOs were developed to clarify the ULO that states, “All students who complete an undergraduate or graduate program at Cal Poly should be able to make reasoned decisions based on an understanding of ethics, a respect for diversity, and an awareness of issues related to sustainability.” The need for such a clarification was illustrated by results of the 2008 NSSE, which showed Cal Poly students lagging behind their peers nationwide, including the CSU and other polytechnic institutions, when it

1.2, 1.5
2.2a, 2.3
2.4

comes to exposure to diverse perspectives (e.g., religion, race, gender) and interactions with people unlike themselves.²³

Results from the Cal Poly Student Survey suggest that the general education (GE) curriculum usually proves more effective in accomplishing the DLOs than major courses do. A case in point is the first objective that promotes an understanding of the relationship between diversity, inequality, and power, which a greater percentage of respondents claim to satisfy in GE (65.9% agree/strongly agree) than in major courses (48.7%). The one exception is the fourth DLO that promotes the ability to live and work with diverse groups of people; here the situation is reversed, with a greater percentage of respondents claiming to satisfy this objective in the major (71.3%) than in GE (65.9%). Surprisingly, for all four DLOs, GE and the major are considered more effective than United States Cultural Pluralism (USCP) courses, a curricular overlay specifically designed to promote diversity learning. This finding should be considered at greater length.²⁴

2.2a, 2.3
2.4

GE, specifically Area D/E Society and the Individual, bears the major burden of diversity learning on this campus. Unfortunately, the Cal Poly surveys also suggest that only a small percentage of students (14.4%) and faculty/staff (21.0%) associate GE with learn-by-doing, which suggests that the campus community perceives learn-by-doing as only weakly associated with learning about diversity. These results may reflect the fact that the knowledge, skills, and perspectives typically introduced and honed in general education are perceived by many as somewhat tangential to a student's professional development in the major, which both student (91.9%) and faculty/staff respondents (88.5%) strongly associate with learn-by-doing. Whether or not the perception is accurate, when the university values a particular pedagogy so highly and an area is perceived as not contributing to that pedagogy, then that area would seem to become undervalued. This observation deserves to be investigated as we proceed with the self-study.²⁵

One place where learn-by-doing and diversity awareness may be converging with positive results is in University Housing's diversity education programs. According to both of the Cal Poly surveys, on-campus housing ranks last as a venue for learn-by-doing, and yet it would seem to be a place where ideas about diversity are learned in application. Student respondents ranked on-campus housing third or fourth on the list of eleven venues where the four DLOs could be attained. In the case of the fourth objective, housing (47.5%) actually ranked above USCP courses (41.9%) as a venue for this kind of learning. As the self-study proceeds, the working group will examine Housing's assessment data to ascertain more clearly its role in promoting student awareness and understanding of diversity-related issues.²⁶

1.5, 2.11

By encouraging a more holistic understanding of learn-by-doing that embraces many ways of knowing the world, multiple ways to do so, and respect for all people without regard to gender, religion, ethnicity, etc., we may more readily demonstrate our professed commitment to provide all Cal Poly students with a genuinely superior educational experience that is truly integrated by a commitment to learn-by-doing and that does indeed prepare them for life in an increasingly diverse world. If learn-by-doing is really at the heart of our collective identity, we should strive to use it more effectively throughout the entire curriculum to help students attain the learning objectives we have established for them. Moreover, we need to ensure that all campus constituencies are not only aware of the learning objectives but also committed to working to address each one of them in ways that seem most appropriate for their respective programs or units.

Learn-by-Doing: A Working Definition

The members of the Learn-by-Doing Working Group do concur with the faculty, students, and staff members who have suggested that the campus community needs to state more clearly what we mean when we invoke this pedagogy. Specifically, we need a more expansive definition of learn-by-doing that captures what distinguishes as well as what unites all members of the Cal Poly community in a shared educational enterprise. When it comes to explaining what we as an institution mean by learn-by-doing, it is not enough to focus on our own individual disciplinary assumptions, processes, and outcomes. On the contrary, surveys of all campus constituencies suggest that we must begin to redefine learn-by-doing by taking into account multiple ways of knowing, that is to say, the different epistemologies, methodologies, and views of the relationship between theory and practice that shape how professionals in each of our respective disciplines understand the world and our place in it.

As we began to compare practices across campus, we also discovered that it is not only the place (e.g., laboratory, stage, archive) that defines learn-by-doing but also the method by which students gradually acquire firsthand experience of the core principles, practices, and ethos that characterize their chosen fields or professions. Learn-by-doing is a process, not a product; local and national student survey results have made it patently clear that this process unfolds not only in the classroom and other familiar curricular venues but also in student clubs and organizations, campus housing, and many types of employment. Thus as we set about explaining our signature pedagogical style to prospective students and colleagues, we must remind ourselves that our learn-by-doing pedagogies break down the spatial boundaries of more conventional educational institutions. They also mediate the traditional teacher-student hierarchy in ways that may be highly beneficial to student learning as well as to faculty/staff scholarship and professional development.

Learn-by-doing, then, is not the property of any one major. Whether we are speaking of aspiring practitioners of materials engineering, ethnic studies, organic farming, teacher education, or biochemistry, we need a more holistic definition of learn-by-doing that highlights the immensely diverse ways and multiple venues in which Cal Poly students gain firsthand knowledge and skills that will enable them to become highly proficient and productive representatives of their chosen professions, in addition to actively engaged citizens and lifelong learners. The working group proposes the following working definition that takes this variety into account: *learn-by-doing at Cal Poly is a deliberate, intellectual process whereby students, acting alone and in consort with others, gradually acquire essential knowledge and skills through active, self-reflexive engagement with the world inside the classroom and beyond it.*

Proposed Action Items

Establish a working definition of learn-by-doing. Based on the findings of the self-study, the Academic Senate should adopt a statement on learn-by-doing that is specific enough to be meaningful and inclusive enough to account for the variety of disciplines, venues, and ambitions that comprise a comprehensive polytechnic university.

Investigate the educational effectiveness of learn-by-doing. Investigate the impact of learn-by-doing experiences on major satisfaction and change-of-major decisions. Begin to survey alumni and employers on the long-term impact of learn-by-doing. Analyze Housing's data to assess the impact of its diversity awareness programs. Use program review to assess the effectiveness of specific learn-by-doing practices.

Strengthen learn-by-doing as our signature pedagogy. Consider ways to address the perceived imbalance between learn-by-doing in GE and the major, including the weak link with diversity learning. 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. Provide sufficient resources to allow programs to support this type of culminating experience.

Theme 2: The Teacher Scholar Model

What does the term teacher-scholar mean to Cal Poly and how does the teacher-scholar model fit within the mission, goals, and values of Cal Poly?

Abstract

This essay begins by recognizing that though Cal Poly is a teaching-centered institution, scholarship has taken on a greater importance as the mission of the institution has evolved. The essay finds that Cal Poly faculty and staff appear to engage in a high level of scholarly activity that enhances student learning, according to the results of the [Cal Poly Student](#) and [Faculty/Staff Surveys](#), the [Department Head/Chair Survey](#), and the literature. Progress toward enacting the teacher-scholar model at Cal Poly, however, has been hampered by the lack of: 1) a comprehensive understanding of scholarship, 2) an accepted working definition of the model, and 3) accessible information or documentation about Cal Poly faculty and staff scholarship.

Some CSU-wide data on scholarship are available, and shared conditions (e.g., common union contracts, space formulas, etc.) make the CSU campuses an appropriate peer group in this area. Some measures show that Cal Poly is actually performing quite well compared to these peers. Unfortunately, support has not kept up with increasing needs, and there continue to be many impediments related to workload, resources, and infrastructure. The solution might lie in a more nuanced understanding of how academic careers change over time. Boyer's idea of the "creativity contract" embodies this understanding and serves as the model for a revitalized professional development plan.

Why is the integration of teaching and scholarship (encompassing research, scholarship, and creative activity) important?

Cal Poly has traditionally been a teaching-centered institution, but, over the last thirty years, scholarship has gradually taken on a role of greater importance. The university's mission is tied to that of the CSU, and the system's mission has changed significantly since the days when faculty scholarship was proscribed in keeping with the strict vision of the 1960 California Master Plan for Higher Education. In 1989, with significant leadership provided by Cal Poly and the Cal Poly President's Cabinet, the Joint Committee for Review of the Master Plan for Higher Education concluded that research, scholarship, and creative activity are central to the mission of the CSU, and the Educational Code was changed to reflect this conclusion. The [Cornerstones Report](#) of 1997 acknowledged this change when it stated that "faculty scholarship, research and creative activity are essential components" of the CSU's teaching-centered mission (Principle 4). A decade later, the [2007 CSU Provosts' Statement](#) asserted the economic value of what has come to be known as the "teacher-scholar model," whereby teaching and scholarship are understood to be mutually reinforcing. The statement identified the model as an important way to keep California's citizens competitive in a global marketplace based on human capital economies—an important consideration for an institution that has always played a major role in preparing the state's workforce. In turn, Cal Poly's current [mission statement](#) emphasizes fostering teaching and scholarship.¹

2.9

The literature on student learning supports the value of an increasing emphasis on scholarship within the CSU and at Cal Poly. Student involvement in undergraduate research is a form of active learning, and it has been deemed a high-impact practice that enhances student retention and engagement.² Though undergraduate research is more common in the sciences, student involvement in faculty scholarship is possible in all disciplines and yields encouraging results. According to the provosts, it increases the frequency of meaningful interactions with faculty and peers; it encourages students to spend more time and effort on research, writing, and analytic thinking; and it involves them in more collaborative forms of learning.

Scholarship also benefits student learning by helping to maintain faculty and staff enthusiasm. As the CSU Provosts have stated, "When faculty [members] are at the cutting edge of their disciplines, they remain connected with the source that feeds their intellectual curiosity and creative abilities and are able to establish and maintain partnerships with other scholars around the world. This scholarly currency, in turn, enhances faculty teaching and interactions with students, from freshman through doctoral levels."³

2.1

The [Cal Poly Student](#) and [Faculty/Staff Surveys](#) show that all constituencies perceive scholarship as helpful in creating engaging learning environments. About 52% of student respondents and about 71% of faculty and staff respondents agreed or strongly agreed that incorporating scholarship into the learning environment has a positive impact on student learning. Students showed a surprising awareness of their instructors' scholarly activities, with about 50% of respondents agreeing that teachers incorporate their consulting, collaborating, presenting, and publishing activities into the learning environment. In the open-ended replies to the question of whether students felt the incorporation of a faculty member's scholarly activities had a positive impact on their learning, roughly 90% of the 500 student comments praised the positive impact. Respondents felt that such activities provided a level of enthusiasm that was contagious and facilitated student learning. They praised the learning experiences that resulted from faculty members collaborating with industry and felt that these experiences better prepared them for real-world challenges.⁴ 2.2a

The comments also indicate the value that scholarly activities can have on the learn-by-doing pedagogy. Students viewed the incorporation of scholarly activities into the classroom as door-openers, establishing and enhancing the credibility of the faculty and the university, commanding the attention of students, and providing the practical application of learned information that is at the heart of learn-by-doing.

What should be the characteristics of the teacher-scholar at Cal Poly?

The teacher-scholar model at Cal Poly has suffered from the lack of an accepted working definition. Successive provosts appear to have had somewhat different views on what it should mean. The model has been defined in the literature as applying to faculty members who embrace the following practices: 2.9

- Active participation in both teaching and scholarship.
- Meaningful student engagement in faculty scholarly activity.
- Inclusion of scholarship in teaching to create vibrant learning experiences for students.⁵

The working group endorses this mutually reinforcing balance between teaching and scholarship and recommends that the Academic Senate do the same.

The question then becomes what type of scholarship is appropriate at Cal Poly, which grants degrees up to the master's level but does not award doctorates and is not classified as a research university. In the Carnegie Foundation report *Scholarship Reconsidered*, Ernest Boyer identifies [four areas of scholarship](#): discovery, application, teaching, and integration. With Boyer's four types of scholarship as its foundation, the teacher-scholar model encompasses a wide range of activities that is applicable across disciplines. The working group endorses Boyer's four types of scholarship for the teacher-scholar model at Cal Poly, and it recommends that all four be recognized in the RPT process.⁶

Inclusive Excellence. As discussed in more detail in the essay on Integration & Student Learning, Cal Poly has committed to "make excellence inclusive," following the lead set by the [Association of American Colleges and Universities](#) (AAC&U). Responses to the Teacher-Scholar Model Department Chair/Head Survey suggest that having diverse scholarly interests and life experiences is an advantage for faculty pursuing the teacher-scholar model. Specifically, 79% of respondents "somewhat agreed" or "highly agreed" that "... we value diverse scholarly interests & life experiences because these positively influence the scholarship & research in which we engage;" 88% "somewhat agreed" or "highly agreed" that "...we value diverse scholarly interests & life experiences because these enrich the perspectives from which we teach," while 62% "somewhat agreed" or "highly agreed" that "... we value diverse scholarly interests & life experiences because these contribute to a more collaborative and respectful atmosphere in the department."⁷ 3.2

Inclusive Excellence (IE) may itself be the subject of faculty scholarship. This study may be expected to occur most often in the humanities, social sciences, and related disciplines, but the working group believes that the faculty of an outstanding 21st-century polytechnic will be engaged in IE-related scholarship within all disciplines, including STEM.

How successful are we currently in implementing the teacher-scholar model?

Answering this question has not been easy. Aside from the promotion packages that Cal Poly faculty members assemble during the retention, promotion, and tenure (RPT) process, which are confidential, there are no standardized, accessible sources from which the scholarly activity of the entire Cal Poly faculty can be directly assessed. The 2009 Retention, [Promotion, and Tenure Focus Group Report](#) recommended that the university explore the use for RPT evaluations of an e-portfolio system linked to a publicly accessible database. Such an exploration is already underway, with the Orfalea College of Business employing Digital Measures, a professional development tool that might be linked in the future to [DigitalCommons](#), a resource currently managed by the Robert E. Kennedy Library to showcase and archive Cal Poly scholarship. The working group supports pursuing this avenue and further recommends that all faculty members participate in using DigitalCommons to showcase their work.

Evidence of Current Scholarship. As discussed above, there is a dearth of evidence that quantifies the full realm of scholarly activities at Cal Poly. Therefore, we must rely on a database of grants and contracts activities conducted within the CSU system as a basis for quantifying and comparing scholarly activity. This database provides a valuable measure of institutional performance. However, extramural funding is more readily available for certain kinds of scholarship than for others, and in some fields rather than others; thus, in general, funding data do not as effectively reflect scholarship performance in (for example) the humanities and performing arts as in the natural sciences and engineering.

The CSU campuses do not always form an appropriate peer group for Cal Poly, but arguably they do provide an appropriate point of comparison when considering current scholarship because they all operate under the same basic policies, procedures, and contractual workloads. Based on funding data, Cal Poly is positioned at neither the top nor the bottom of its CSU peers. At \$50,092 per full-time equivalent faculty (FTEF), Cal Poly ranked fifteenth out of the twenty-one CSU campuses assessed for average annual grant proposals over the 2005-08 time period; we ranked fourteenth for the average annual grants awarded at \$22,490 per FTEF. The CSU averages per FTEF were \$75,768 and \$33,477, respectively ([Figure 1](#)). The majority of these grants and contracts support faculty scholarship, while some support student activities.

Trend data indicate that Cal Poly's grant awards are increasing at a faster rate than those received by most other CSU campuses. Over the 2005-2008 time period, the CSU average grant award per FTEF actually decreased by \$6,097 ([Figure 2](#)). In contrast, Cal Poly shows an increase of \$4,655 per FTEF over the same time period, which is the third highest increase in the CSU. The upward trend for Cal Poly started well before 2005; its average annual total awards grew by nearly 288% between 1998 and 2008 while the equivalent figure for the CSU as a whole was closer to 133%.

Of the grant awards received at Cal Poly, a larger proportion goes to students in the form of student assistant wages than at most other CSUs ([Figure 3](#)). Cal Poly's 6.4% in 2007-08 ranked second to CSU Chico's 9.1%, with the CSU average at 3.4%. Cal Poly also used grant money to employ more students than most other CSU campuses assessed during this time period, with 3.4% of FTE students receiving wages from grants; this proportion was equaled by CSU Chico and exceeded only by the campuses at Humboldt (5.2%) and Monterey Bay (5.1%). The CSU average was 1.9% ([Figure 4](#)).

Because student involvement in faculty scholarship is a form of learn-by-doing, these data suggest that scholarship at Cal Poly can contribute significantly to student learning; this contention is supported by the literature and by the previously cited student survey data.

In addition to the CSU-wide data, we have evidence obtained from the Cal Poly Faculty/Staff Survey. The survey shows a surprisingly high level of current scholarly engagement; about 60% of respondents agreed or strongly agreed with the statement that Cal Poly currently is engaged in scholarship to develop knowledge and maintain professional currency. Between 70-80% of applicable respondents reported that they were involved in consulting/collaborating with government or industry (72.7%), reviewing manuscripts for publishers (70.1%), publishing a paper or book (78.2%), and presenting scholarly work at a professional conference (81.7%) in the last two years. Lower

percentages were reported in the areas of performing arts (11%), exhibition arts (22%), and reviewing (40%) or applying for grants (64%). These are percentages of respondents for whom the aforementioned activities are applicable to their discipline, i.e. 22% of those who might exhibit art as part of their discipline do so.⁸

These numbers are somewhat corroborated by the 2009 Department Chairs Survey in which 66% of respondents estimated that more than 75% of their faculty members were engaged in peer-reviewed publishing activities in the last two years. Also, 52% of respondents estimated that more than 75% of their faculty members were engaged in applying for grants. Based on this self-reported evidence, it appears that a substantial proportion of Cal Poly faculty members are actively engaged in scholarship within their disciplines.⁹

Current Support for the Teacher-Scholar: Teaching. In order to build on and improve these scholarly efforts and their contributions to student learning, the university needs to support faculty in both their teaching and scholarship. New faculty members are most often hired directly from PhD programs or post-doctoral positions that focus on scholarly activities. Guidance during their transition to Cal Poly's teaching-oriented environment is, therefore, important. Several colleges and departments have informal mentoring programs to assist new faculty, but the College of Agriculture, Food, and Environmental Sciences (CAFES) has instituted a formal program that assists faculty members in teaching, professional development, and the establishment of an appropriate research program. There has not been an assessment of the impact of mentoring at Cal Poly, but there are plans to do so in CAFES. Should an impact assessment find positive results, the working group recommends that the university explore the development of more formalized mentoring programs. 3.4

Another source of support for the entire faculty is the [Center for Teaching and Learning](#) (CTL), which was developed following the previous WASC review. CTL offers training and guidance with the goal of enhancing "teaching and learning by providing resources for professional development and collaboration."¹⁰ CTL's effectiveness was demonstrated in winter 2007 when Cal Poly participated in the [Collaborative on Academic Careers in Higher Education](#) (COACHE) project to determine factors important to the success and job satisfaction of probationary faculty. According to this survey, 83% of 77 tenure-track faculty respondents believed that CTL activities had enhanced their teaching, and 60% of 64 tenure-track faculty respondents believed that CTL activities had enhanced their professional development.¹¹

Current Support for the Teacher-Scholar: Library Resources. Library resources are necessary to support scholarly and creative activity. Based on total library expenditures per FTE student, Cal Poly currently spends about half of what its peers do on all forms of library resources, paper and electronic: \$285 vs. a median of \$669. Annual book purchases at Cal Poly have dropped from nearly 16,000 in 1983-84 to only 3,900 in 2007-08, an amount that is lower than fourteen other CSU libraries. In both [2005 and 2009 LibQual national surveys](#), Cal Poly faculty reported that the library's collections are falling seriously short as measured by the gap between perceived and desired collection strength. This finding is particularly distressing because access to collections through CSU-wide electronic licensing of scholarly journals and databases has grown significantly since 2005.¹² 3.6

In contrast to this data about library resources, library services at Cal Poly are very highly regarded. Recent service quality surveys in 2005, 2008, and 2009 show that services are considered very good by most Cal Poly faculty, staff, and students. For example, in a [2009 survey of Interlibrary Services](#), most users found overall quality to be excellent (39%) or good (47%). However, many of those surveyed also noted that excellent interlibrary services are not an adequate replacement for a larger investment in scholarly information resources. A significant increase in the library's budget is needed to bring the level of access to scholarly resources at Cal Poly up to the level of both its CSU and national peers.

Current Impediments to Implementing the Teacher-Scholar. The Academic Senate's Research and Professional Development (R&PD) Committee studied teacher-scholar model implementation in 2007 and found the two biggest impediments to be time/workload issues and lack of clarity in retention, promotion, and tenure (RPT) processes.

Cal Poly faculty members have indicated that lack of time due to workload is the greatest impediment to fully implementing the teacher-scholar model. Tenure-track faculty respondents to the COACHE survey rated their satisfaction for the amount of time they have allocated to conduct research/produce creative work 0.90 points lower on a 0.0-5.0 scale than faculty from all other participating universities. In the same survey, Cal Poly faculty were 0.50 points lower than the participating university average for satisfaction with the balance of time between professional and personal/family time. About 35% of the comments in the COACHE survey mentioned changing the work/life balance as the number one action Cal Poly could take to make the university a great place to work.

Some additional evidence corroborates this perception. The [2002 CSU Faculty Workload Report](#) found 46.3% of Cal Poly respondents received assigned time (time released from teaching) to pursue scholarship, averaging 4.9 weighted teaching units (WTUs) each from external and internal sources; in comparison, the CSU average was 52.4% of respondents averaging 5.0 WTUs each. Looking at more recent data, the 2009 Department Chair Survey reveals that roughly an equal number of respondents (35%) do not allocate any release time for scholarly activities as allocate between 2 and 20 weighted teaching units or WTUs (38%). The remainder of respondents was evenly distributed at about 10% in each of the following allocations: between 26 and 50, 51 and 100, and 101 and 150 WTUs. Cal Poly's Institutional Planning & Analysis Office plans to do a detailed analysis on current faculty workload in the near future.¹³

In order to create more time for scholarly and creative activity, faculty/staff survey respondents slightly preferred hiring lecturers over student teaching assistants as replacements for permanent faculty on release time. About 80% of respondents would agree or strongly agree with the use of discretionary funds to support scholarly activities. There was moderate support for using college-based fees, providing more credit for supervising student research, and hiring new faculty members who have a research component to their appointment. Respondents were least willing to increase class sizes to reduce teaching loads, with 48% strongly disagreeing or disagreeing vs. 40% agreeing or strongly agreeing to this action.¹⁴

In addition to lack of time, lack of clear expectations for the Retention, Promotion, and Tenure (RPT) process has also impeded the full implementation of the teacher-scholar model at Cal Poly. Data on faculty attitudes toward RTP drawn from the previously cited COACHE survey are considered especially credible because respondents were drawn only from those currently engaged in the process. In that survey, Cal Poly faculty members rated the tenure standards in their departments to be less clear (0.47 less on a 5 point scale) than faculty members in the CSU and at other institutions.¹⁵

Anxieties related to expectations for RPT might be expected to decrease with experience at any institution. However, 30% of respondents to the Cal Poly Faculty/Staff Survey, which includes faculty of all ranks, disagreed or strongly disagreed with the statement that scholarship expectations for RPT were clear while 36% agreed or strongly agreed. The working group concluded that, a substantial portion of the faculty, whether tenured or not, is not satisfied with the clarity of RPT expectations.¹⁶

In an effort to provide some guidance through the RPT process, Cal Poly requires each faculty member to create a professional development plan (PDP) and include it in the member's Working Personnel Action File (WPAF). The PDP is an important unifying tool that can help the member plan for and execute his/her academic career in consonance with RPT requirements. However, the [2007 Research & Professional Development \(R&PD\) report](#) called for clearer guidance on PDP expectations and a process by which to approve the plans and hold faculty members accountable to them.

What should be the goals and expectations for faculty at Cal Poly regarding teaching and scholarship?

Cal Poly must be careful not to hire as if it were a research institution and then support scholarship as if it were a community college. By doing so, we risk creating a generation of disenchanting faculty members who are dissatisfied with their careers. To avoid this pitfall the working group supports enacting the above and other recommendations from the R&PD Committee as passed by the Academic Senate in [AS 690-09 Resolution on Retention, Promotion, and Tenure Focus Group Report](#) and listed below:

- “The University should provide clear guidelines and a common format for the Working Personnel Action File (WPAF). 3.3
- Each college should establish common faculty evaluation procedures to be used for all departments within the college.
- The University should recommend that colleges consider the multiyear appointment procedure for probationary faculty that has been developed by the College of Science and Mathematics.
- The University should produce a comprehensive statement on scholarship and professional development to reflect the University’s vision of the Teacher-Scholar Model. 2.8
- The University should establish guidelines to assist faculty in the development of Professional Development Plans to encompass teaching, scholarship/professional development, and service, and to clarify the method by which they will report the progress they have made toward their goals. 2.9
- The University should establish an environment and develop the resources to support faculty members in their endeavor to become successful teacher-scholars.
- Specific criteria and expectations regarding service should be included in college RPT guidelines.”

The working group supports enacting these recommendations as methods to address faculty concerns over workload issues and lack of clarity in the RPT process.

Professional Development Plan. The working group also supports adapting the Professional Development Plan (PDP) to operate as a “creativity contract.” As set forth in the Boyer report, the creativity contract is designed to reflect individual faculty members’ differing expectations, talents, and interests and to allow flexibility within their career paths. According to Boyer, faculty members might begin their careers conducting scholarly activities in the area of discovery, as that is how most graduate students have been trained. Then, they may begin to do more work applying their scholarship to improve the human condition. Later, after establishing connections within the university, they may wish to conduct more integrative work because senior faculty members are likely to be in an optimal position to see the connections required to solve lingering problems in multiple disciplines. We must be careful, however, not to develop a two-tiered system, with the probationary faculty engaged in the scholarship of discovery and the tenured faculty encumbered with a less appreciated service burden. High demands for faculty service therefore require that achievements in the service area be recognized and appropriately rewarded in the RPT process. 2.9

If we follow this model, the PDP would require continual reassessment and readjustment of the relative emphasis placed on teaching, scholarship, and service, as well as the relative emphasis placed on different types of scholarship. This type of flexibility throughout a faculty member’s career is epitomized by the Orfalea College of Business’s “Faculty Annual Report.” The PDP would also be more forward-looking, anticipating the way a faculty member’s career might change as he or she proceeded down the promotion path.

By allowing for flexibility and rewarding different forms of scholarship, Cal Poly would likely extend the productive career of faculty members. When faculty members are productive they remain enthusiastic, which carries over into the classroom. Enthusiasm is exactly the contagion that facilitates student learning, as demonstrated by the Cal Poly Student and Faculty/Staff Surveys and mentioned repeatedly in the literature.¹⁷

Proposed Action Items

Encourage the Academic Senate to Formally Endorse the Teacher-Scholar Model as Defined in this Self-Study. At the same time, the Senate should be encouraged to define scholarship in Boyer’s terms to include discovery, application, integration, and teaching/learning.

Make the RPT Process More Clear and Consistent. Implement AS 690-09 Resolution on Promotion and Tenure Focus Group and AS-691-09 Resolution on Research and Professional Development. Consider establishing a university-level RPT committee.

Track Scholarship More Effectively. Provide greater access to the results of scholarly activities at Cal Poly by supporting the DigitalCommons framework and encouraging faculty to participate. Continue to explore the use of

software such as Digital Measures that protects the confidential process of RPT and yet is linked to a publicly accessible system such as DigitalCommons.

Provide the Library with an Appropriate Level of Resources. Work with the provost to increase the allocation of funds to the library in order to expand its ability to support scholarship. Over the next ten years, resources in support of scholarship should be brought up to the levels found at identified peer institutions, measured on a per-FTE basis. Sources of revenue are likely to include student fees, research overhead funds, donations, and/or state allocations, reflecting a university-wide commitment to fund “common goods” essential to the health of all colleges and other units.

Develop a “Creativity Contract” embodied by the Professional Development Plan at Cal Poly. This should recognize and reward various forms of scholarship as appropriate in various disciplines and at various stages in a faculty member’s career. It should also allow for flexibility in the balance of time allocated to teaching, professional development, and service activities. Identify exemplary instances of the teacher-scholar model at Cal Poly so that there are consistent RPT expectations for faculty at the same level of promotion across the university. Assess the impact of existing mentoring programs across campus. Survey faculty who utilize CTL programs and library resources. Enhance support of those programs, services, and resources that most effectively support the teacher-scholar model.

Theme 3: Integration and Student Learning

How can we ensure personal, professional, and intellectual growth of our students to prepare them as responsible citizens for the challenges and opportunities of the 21st century?

Abstract

This essay considers the assessment of student learning at the program and university levels. Cal Poly conducts program-level assessment of student learning as part of a revised process for academic program review that was introduced after the last WASC visit in 2000 and that is yielding good results. In addition, progress is being made in the implementation of the e-portfolio as a tool to facilitate both student learning and the assessment of that learning.

Cal Poly conducts university-level assessment via the ULO Project, which complements program review by ensuring that all students across campus are achieving expected levels of performance in relation to the [University Learning Objectives](#) (ULOs), which were approved in 2007. Departments must show alignment with the ULOs in the course of program review.

A key contention of this essay is that learning takes place in a number of different venues. Our challenge is to integrate the array of learning experiences that make up a student's career, and there are examples of highly integrative practices taking place across campus. These are consistent with the [Cal Poly Mission Statement](#), which recognizes the importance of the co-curriculum but fails to explicitly acknowledge the staff as a partner in the development of the Cal Poly graduate. After the Mission Statement, the ULOs are our most important engine of integration, since they define a common set of expectations for all programs in Academic and Student Affairs. The Cal Poly surveys indicate that awareness of the ULOs is lower than might be desired, but students, staff, and faculty are very much engaged with the concepts that make up the ULOs, which also serve as the basis for the general education learning outcomes (GELOs).

1.1, 1.2

Cal Poly has adopted the AAC&U model of Inclusive Excellence as a part of its effort to improve the academic performance and success of all students, including those from underrepresented groups. Survey data tell us that our students are lagging behind their peers in the area of diversity learning; this problem is being addressed in the curriculum through the [Diversity Learning Objectives](#) and in the co-curriculum through programs that focus on such learning or provide support to underrepresented and/or low-income students. Several academic support functions, including the Study Session program and Supplemental Workshops in Science and Math, have already been shown to have a broadly positive impact; these improve what NSSE paints as a mixed picture of advising and student success programming at Cal Poly. The University should focus on increasing the effectiveness of such efforts while attempting to better integrate academic policies that impact student success.

1.2, 1.5

How well are our students achieving academic program learning objectives?

Although departments at Cal Poly have been encouraged for a decade or more to develop, publish, and assess student learning against program objectives, in recent years this practice has become a clear expectation of program review. At the time of our previous WASC accreditation visit in 2000, we had already begun to re-examine the review process. After an extensive study of procedures used statewide and nationwide, the [Task Force on Institutional Accountability and Learning Assessment](#) proposed a revised, improvement-oriented process for Cal Poly. The changes aimed to make the review more program-specific and to include more constituents, including the college dean and the entire faculty. Programs could choose one or more issues to study based on what they considered most important. All programs were required to have programmatic learning objectives in place with plans to assess those objectives. The revised process also added a feedback loop that included the development of an action plan for improvement.

4.4

1.3

1.2, 2.1

Since its introduction, the review process has evolved due to changing circumstances and lessons learned from its implementation. Detailed guidelines and support materials are posted on the [Academic Programs website](#). Changes to the process include the following:

2.3

- The curriculum (and co-curriculum if possible) must be aligned with the ULOs.
- Our Office of Institutional Planning and Analysis (IP&A) provides standard program information to each program at the start of its review cycle, including data on retention and graduation rates as well as time to degree, disaggregated by student categories.
- The self-study must contain an analysis of, and reflection on, the IP&A data.
- The self-study must include data from the assessment of student learning outcomes, using the department's most recent submission of the [WASC Program Assessment Inventory](#) as an outline. The data must emphasize *how the faculty uses the evidence to improve learning experiences for all students*. 1.9, 2.1
- The entire faculty meets with the provost and dean (or designees) at the outset of the action-plan process.

Beginning in AY 2008-09, about 75% of all academic programs will be reviewed over the course of three years, providing ample opportunity to gauge the success of the latest revisions; the results, of course, will be assessed during the Educational Effectiveness Review. To date, our experience has been encouraging: the latest self-studies generally demonstrate a willingness and ability to follow the guidelines, which require examples of "closing the loop" using assessment results to improve student learning. Progress reports on implementing the action plans have demonstrated the same thing. A recent innovation, piloted in the Orfalea College of Business, consists of an integrated form of program review ([Appendix Y](#)), in which representatives of the major join one or more representatives of general education (GE) in jointly reviewing GE's contributions to overall student learning. 2.1, 2.7

In addition to periodic program review, specific Cal Poly programs have begun to use a guided e-portfolio process to provide structure and consistency to ongoing learning-outcomes assessment. How this tool will integrate with program review has not yet been determined, but the working group imagines that, with time, practice, and experience, it will become a valued and regular part of the process.

The former College of Education¹ was the pioneer in this area, responding to a state mandate by adopting TK20, an electronic data management system. The Architecture Department has followed, building on its own disciplinary tradition of viewing the portfolio as a professional necessity. In Spring 2009, the Architecture faculty voted to require all students to submit digital summaries of their work, with the understanding that the resulting document would serve a variety of purposes: reflection, diagnosis, assessment, various kinds of internal reviews, and the student's own professional development. The provost, understanding the e-portfolio to be an important part of our technological capacity, asked Information Technology Services (ITS) to provide support for this effort. After much discussion, planning began in Spring 2009; ITS purchased a Blackboard module in Summer; and Architecture began a pilot project in Fall. This pilot will be expanded to include the rest of the College of Architecture and Environmental Design before being made available to the entire university. 2.2, 2.5, 2.6, 3.7

Finally, Student Affairs has also been involved in learning outcomes assessment for several years, and it continues to develop and refine such processes in all its departments. Evidence-based decision making has enhanced programs in many areas, including University Housings' Fall 2009 *Launch* program for all new students, Student Academic Service's [Supplemental Workshops in Science and Math](#), and programs offered under the umbrella of Associated Students Incorporated. Other programs, including the [Summer Institute](#) and [Upward Bound](#), have assigned learning outcomes to embedded assessment opportunities, which is consistent with the goals of academic program review. Continuing to focus co-curricular outcomes on the ULOs, DLOs (Diversity Learning Objectives), and SLOs (Sustainability Learning Objectives) will further connect the program review processes in Academic and Student Affairs, thus integrating our pursuit of educational effectiveness. 1.2, 2.3, 2.9, 2.11

How well are students achieving our new ULOs?

In 2007, after a lengthy campus conversation, the Academic Senate adopted a set of [University Learning Objectives](#), commonly known as the ULOs. In response to specific and longstanding concerns, the ULOs were subsequently amplified by two addenda: the [Diversity Learning Objectives](#) (DLOs) in 2008 and the [Sustainability Learning Objectives](#) (SLOs) in 2009. Both the incorporation of these learning objectives into program review and the establishment of an assessment strategy known as the ULO Assessment Project have been relatively swift.

The ULO Project was designed to ensure that all students are achieving expected levels of performance at various points in their academic careers and to gather evidence of added value, i.e., improved performance over time, as a result of their education. As such, the project forms an effective complement to the discipline-specific focus of program review. The process consists of the following stages: 2.2a, 2.4

- Campus consultants are identified and serve as leaders and advisors on issues of curriculum and assessment pertaining to specific ULOs.
- These consultants work with broadly representative task forces to develop ULO-specific rubrics that can inform teaching and assessment of student learning.
- In selected courses at different levels throughout the curriculum, artifacts such as essays, test responses, project reports, etc., are collected from all students or from random samples of students. The artifacts are the products of assignments that provide students with opportunities to demonstrate their performance in relation to specified outcomes derived from the ULOs.
- These artifacts are reviewed by panels of experts (faculty members and representatives of other stakeholders, such as members of industrial advisory boards) to evaluate student performance in relation to the specified outcomes. Scores are assigned based on the ULO-specific rubrics.
- The results are analyzed and incorporated into workshops and other forms of professional development to help faculty and staff members improve their teaching.

During AY 2008-09, consultants and committees began this process for the Diversity Learning Objectives and two areas of the ULOs: Writing Proficiency (a component of Effective Communication) and Lifelong Learning. 2.2a
Participants created assessment plans, defined attributes and measurable learning outcomes, developed rubrics, and, in some cases, began analysis of student work. In 2009-2010, two more consultants and committees began to work on the areas of Ethics and Oral Communication. Assuming that the project is producing useful results, three more consultants and committees are expected to begin work in 2010-11 on Science/Math/Problem Solving/Sustainability, Creative Thinking, and Physical/Psychological Health.

This process was designed to be ongoing, but, due to current budget constraints, it will need to be reassessed on a regular basis and its continuation weighed against other demands for resources. After an initial two-year cycle for each ULO or group of ULOs, the project will likely be moved from Academic Programs into the colleges. If so, each college will be asked to assess the same one or two ULOs each year using the rubrics and assessment methods developed by the consultants and committees. The intent will be to produce both college-specific results and data that can be aggregated to evaluate institution-wide performance.

It has been proposed that, at some point within the next few years, we should set minimum performance levels required for graduation, based on the ULOs. The closest thing we have to this currently is the level of writing required to satisfy the Graduation Writing Requirement (GWR), but the reliability of this measure is questionable given the fact that the requirement can be fulfilled through multiple formats. The proposal to establish minimum performance levels is controversial, and is likely to be hotly debated by the faculty. 2.2a

How do we more effectively integrate the educational experiences of our students?

A key contention of Cal Poly's self-study is that learning takes place in a number of different venues—curricular, co-curricular, and work-oriented. The literature on student learning supports this contention. Astin, for example, states that “experiences in various in-class and out-of-class settings, both on and off the campus, contribute to learning and personal development.”² Kuh, Chickering, and Boyer all agree,³ as do respondents to the Cal Poly Student and Faculty/Staff Surveys, which were conducted for this self-study. 2.11

It is not enough, however, to observe that learning takes place in different venues; our challenge as educators comes in consistently and intentionally integrating the array of learning experiences that make up a student's career. The problem is the silo, our tendency to look at a university education as a series of compartments on a flowchart. We tend to leave it up to students to synthesize their experiences. Pascarella and Terenzini suggest that this approach may not be the most effective in promoting the kind of behavior we know is associated with academic success: “If, as it appears, individual effort or engagement is the critical determinant of the impact of college, then it is important to 2.13

focus on the ways in which an institution can shape its academic, interpersonal and extracurricular offerings to encourage student engagement.”⁴

We at Cal Poly have a compelling opportunity to more clearly connect our students’ various learning experiences, given the evidence of an already solid foundation in many areas. Students place a high value on their overall Cal Poly experience: on the 2008 National Survey of Student Engagement (NSSE), 87% of seniors reported that they would probably or definitely pick Cal Poly again. Our programs are strong, producing graduates that are in high demand by employers, and the co-curriculum is particularly robust and highly regarded. According to the Cal Poly Student and Faculty/Staff Surveys, most of the campus views co-curricular experiences as helpful in students’ personal and professional lives: 83% of student and 89% of faculty and staff respondents agreed or strongly agreed with this contention. Such a high level of support translates into action: of those faculty/staff respondents who interact with students, 74% report that they have been engaged with club activities and incorporated them into their work with students. Sixty-four percent of the Faculty Survey of Student Engagement (FSSE) respondents said Cal Poly emphasizes encouraging its students to participate in co-curricular activities, and students who responded to the 2008 NSSE are more actively involved in the co-curriculum at Cal Poly than respondents from other CSU campuses.⁵

2.2

The Cal Poly Mission Statement, adopted in 2007 after a lengthy campus conversation, recognizes the importance of both the curriculum and the co-curriculum. The statement highlights the close partnership of students and faculty that has been a distinctive part of our institutional identity, yet it fails to explicitly acknowledge an essential collaborator: *the university staff*. The working group believes that a critical step in our pursuit of integration and student learning is to remedy this defect in our intellectual capacity by officially including the staff as partners in the development of the Cal Poly graduate. Results of the Cal Poly surveys show that all campus constituencies acknowledge the role in student learning of the co-curriculum, a staff responsibility, but the university’s capacity would be sorely diminished by the absence of staff involvement in the curriculum as well.

1.1

After the Mission Statement, the ULOs should constitute our most important engine of integration because they define a common set of expectations for all programs—curricular and co-curricular, graduate and undergraduate, GE and the major. As such, the ULOs are also an important component of our capacity. Preliminary data from the Cal Poly surveys indicate that, while awareness of the ULOs per se is inadequate among all groups, students, faculty, and staff members are very much engaged with the core concepts that make up the objectives.⁶ Furthermore, students reported a wide range of venues including the major, GE, and co-curriculum in which this kind of learning happens.

2.2a, 2.2b

The integrating character of the ULOs is evident in the context of program review, where they provide a consistent framework for assessing a variety of learning experiences. As a part of this process, they are mapped against the internal goals of the program and, if extant, the external standards of the discipline or profession. This happens both in the Office of Academic Programs, which oversees GE and the majors, and in programs sponsored by Student Affairs. In the latter case, the Council for the Advancement of Standards in Higher Education (CAS) provides professional standards to guide student learning and development programs and services. Mapping the ULOs to the CAS Standards ([Appendix W](#)) shows the inherent linkages between the curriculum and the co-curriculum, as all of the objectives connect directly with a specific standard. This exercise graphically supports the contention that students acknowledged in every survey utilized by this self-study: that student experiences in the co-curriculum serve to develop their personal and professional skills in concert with their curricular experiences.

The integrating character of the ULOs is also evident in GE, which has developed focused general education learning outcomes (GELOs) based on the ULOs. These have, in effect, become the goals of GE, as befits a program that emphasizes breadth and serves the entire university. The ULOs thus provide a common template for developing and assessing student performance. They serve to mediate the development and transfer of skills from lower-division GE experiences to upper-division experiences in the major; the development of mastery in the major is in turn buttressed by upper-division experiences in GE. The entire process is supposed to be capped by the senior project—a signature component of the Cal Poly student experience—but the lack of a robust university-level policy means that the project is not necessarily a capstone. The existing policy, which currently is being re-examined, gives programs considerable discretion over the nature of the project; although the requirements must be the same for all students in

the major, we cannot now expect them to demonstrate in the senior project mastery-level skills that have developed across a broad range of experiences.

There are differences among the faculty as to the value placed on GE as an integrating component of our capacity. Furthermore, not all understand the degree to which the GE structure is determined by CSU policy rather than by campus preference. More or less successful attempts have been made to withdraw from the common core of GE, and President Baker in 1997 approved a governance model that some have misunderstood as removing GE from the purview of the Academic Senate. In fact, a reading of the original Senate resolution shows that this was never the case, although in practice the Senate rarely has taken up GE-related issues during the past decade. The resolution described GE as the equivalent of an academic program, in which the normal curricular process of department, college, and university reviews would find its parallel: “Just as a department makes curricular and programmatic recommendations via a dean to the Academic Senate, the GE Committee ... makes curricular and programmatic recommendations to the Academic Senate via the Provost.”⁷

This model has had the advantage of giving GE the coherence of a normal academic program; it has had the disadvantage of supplementing the normal curricular review process with an extra layer of review. Thus, a GE course must be reviewed at six levels: department, college, university, GE subject-area committee, the governing GE Committee, and the Provost’s Office. (There were once seven levels for courses proposed to satisfy the United States Cultural Pluralism requirement.) This complicated process does not make for the kind of institutional agility that is called for in the essay on Our Polytechnic Identity, a situation that has become ever more untenable under the pressure of the current budget crisis. Provost Robert Koob has responded by declaring 2008-09 to be “the year of the curriculum” and by asking the Academic Senate to consider ways to achieve a more effective partnership between GE and the major programs. Academic Senate Chair Rachel Fernflores has appointed a broadly representative taskforce, which is expected to make a proposal during the current academic year (2009-10).

In addition to these curricular and co-curricular experiences, on- and off-campus employment provides many Cal Poly students with valuable opportunities for pre-professional growth that should be given direction by the ULOs. On the 2008 NSSE, 61% of seniors indicated that they had participated in internships, practicums, or co-ops; we do not know how well these were integrated with other forms of learning, but we do not that, on the Cal Poly Student Survey, 21.0% of all respondents noted that their employment consisted of some form of professional service related to their major (28.7% for off-campus employment and 7.6% for on-campus employment). The student and faculty/staff surveys indicate that the campus values such experiences, with 79.3% of student respondents agreeing or strongly agreeing that their off-campus employment will help them in their personal and professional lives, 68.8% of student respondents agreeing or strongly agreeing that their on-campus employment will help them, and 73% of faculty/staff respondents agreeing or strongly agreeing that both on and off-campus employment will help students in their personal and professional lives.⁸

It is clear that a variety of learning experiences already exist at Cal Poly, as does a high level of student participation, but it remains for us to consciously connect these various activities using the ULOs as an integrating framework. Examples of highly integrative practices are already taking place across the campus; these include service as a student leader, facilitation with Supplemental Workshops in Science and Math, an “Executive Partners” mentoring collaboration between University Housing’s Living Learning Program and the Orfalea College of Business, and linked courses between Materials Engineering and General Education ([Appendix X](#), Case Studies 1). These all show progress in the successful integration of student learning, though there is surely room for growth and improvement.

2.8, 2.9

As we continue to learn where students achieve the ULOs, we will continue to discover where the integration of curricular, co-curricular, and work-oriented experiences is already taking place and where it can be fostered. Alignment of outcomes in GE and the major as well as in those programs sponsored by Student Affairs will encourage such integration, as will external initiatives like the CAS Standards and the four “essential learning outcomes” promoted by the National Leadership Council for Liberal Education and America’s Promise (LEAP); these have been integrated into the CSU requirement for general education in Executive Order 1033. The full array of student work experiences certainly should be considered part of the educational mix. Such a compounding of

experiences, the skills learned in one venue overlapping and reinforcing those learned in another, will contribute to the educational effectiveness of the institution, whose integration should contribute to the wholeness of the student experience ([Figure 1](#)).

What can we do to improve the academic performance and success of all our students, including those from underrepresented groups?

In November 2007, an overnight retreat was held at a location in Santa Barbara County to discuss diversity and campus climate. Attendees included vice presidents, deans, and other senior administrators, as well as some faculty and staff representatives. President Baker joined the group on the second day. After awareness-raising sessions on the first day led by Lee Mun Wah, a facilitator from the organization “Stir-Fry,” a panel of underrepresented students talked about their own, often discouraging experiences at Cal Poly. On the second day, Alma Clayton-Pedersen, a vice president of the Association of American Colleges and Universities (AAC&U) facilitated sessions in which the association’s Inclusive Excellence (IE) model, now widely adopted in higher education, was introduced and discussed. The model is based on the assertion that a university must be inclusive in order to be excellent and is therefore a retort to those who would argue that equity comes at the expense of quality. The quest for diversity within the institution is therefore not only a matter of achieving social equity for underrepresented groups; it is critical for those students in the majority if they are to be fully prepared to live and work in an increasingly diverse and interdependent global society.

For the most part, feedback from attendees was quite positive. Soon after the retreat, the president’s Executive Staff charged the Diversity Planning Group, a task force of the University Diversity Enhancement Council, with reviewing diversity-related plans and other documents; making recommendations regarding actions that should be continued, expanded, or modified in the short term; advocating for strong consideration of diversity-related issues in the university’s strategic planning and WASC reaffirmation processes; and recommending to the Executive Staff whether the IE model should be adopted at Cal Poly. The group ultimately submitted a set of recommendations, including one in favor of adopting the model. (The history of the council is shown on the [Inclusive Excellence](#) web site.

1.5

In his 2008 Fall Conference speech, echoing the words of the AAC&U, President Baker urged us all to “make excellence inclusive.” During the same week, the Academic Senate discussed the IE model at a retreat facilitated by Clayton-Pederson. Recently compiled data from the 2008 NSSE and other sources were presented at this retreat; both suggest that our students are lagging in terms of diversity learning. On the NSSE, in response to the question, “To what extent has your experience at this institution contributed to your knowledge, skills and personal development regarding understanding people of other ethnic or racial backgrounds,” our freshmen rated their experiences closer to some than to quite a bit (2.28 on a scale of 1 to 4, with 2 being some and 3 being quite a bit, as compared with all CSU freshmen at 2.79 and all NSSE freshmen at 2.67); our seniors rated their experiences slightly worse (2.14 as compared with all CSU seniors at 2.75 and all NSSE seniors at 2.65). At best, this result could reflect changing expectations as students proceed through the curriculum; at worst, it could imply a disturbing subtraction of educational value.⁹

The Academic Senate retreat helped to advance the dialogue on diversity, which gained added attention due to a subsequent, widely publicized incident involving racial bias on the campus. The Academic Senate ultimately adopted [AS 682-09 Resolution on Making Excellence Inclusive at Cal Poly](#), which both expressed approval of the IE model and called for greater recognition and support of faculty efforts in this regard. Meanwhile, the Board of Associated Students Incorporated passed its own supporting resolution. With the president’s approval, the Inclusive Excellence model was now formally adopted at Cal Poly. As an early consequence, the existing Student Success Council was consolidated with the University Diversity Enhancement Council to form a new [Inclusive Excellence Council](#).

Another consequence was a decision to give students access to “ombuds” services, that is, to provide them with the opportunity to consult confidentially regarding a range of concerns, not limited to biased incidents, with a professional who is independent and neutral, knowledgeable about university policies and procedures, and skilled in conflict resolution. Once the ombuds office has been established, most likely at the beginning of 2010, students will be given the option of communicating in a confidential manner via an online system, operated by an off-campus

provider. In addition, the university is currently searching for a consultant who will plan and lead a program of “train the trainer” workshops, also at the beginning of 2010, to help create a cadre of faculty and staff who in turn will provide workshops for other campus employees. The intent is to widen the circle of allies who better understand what is required of an institution that seeks to embrace the core values related to diversity, integrity, mutual respect, and, more generally, Inclusive Excellence and who also have the skills needed to move us in this direction.

Inclusive Excellence provides a compelling model of general institutional performance. However, well before the model was considered for adoption at Cal Poly, a task force had examined the specific issue of how diversity is addressed in the curriculum. In its 2004 report, this task force recommended that the university adopt a set of diversity learning objectives. No action was taken on this recommendation until 2008, when the Academic Senate expanded on the ULOs by passing [*AS 663-08 Resolution on Diversity Learning Objectives*](#).

Like other learning objectives, the DLOs do not require the teaching of a particular point of view or set of values; rather, they call for graduates to be able to demonstrate applicable knowledge and understanding, to consider a breadth of perspectives in decision making, and to “function as members of society and as professionals with people who have ideas, beliefs, attitudes, and behaviors that are different from their own.” Furthermore, the DLOs do not insist that diversity be addressed to an equal extent in every course; instead, each program is responsible for ensuring that the required learning takes place by drawing on the totality of experiences that take place in a student’s career.

Such learning will be assessed directly in the course of program review and in the context of the ULO Project. It has already been assessed indirectly through the Cal Poly Student Survey, which indicates insufficient knowledge of what is admittedly a very new policy. About a third of the respondents (34.6%) agreed or strongly agreed that they were aware of DLOs; a somewhat higher number (39.1%) disagreed or strongly disagreed with this statement. Such evidence helps to explain why the president has sought to engage the campus in establishing a more inclusive and supportive environment.¹⁰

In addition to the implementation of academic policy statements like the DLOs, another path to improving student success is to intentionally develop aspects of the co-curriculum that focus on diversity learning. Cal Poly examples include PRISM: LGBT Peer Counseling & Mentoring Program, Cal Poly PULSE: Peers Understanding Listening Speaking Educating, and the Cal Poly Partners Program ([*Appendix X*](#), Case Studies 2). The university also provides several programs that support underrepresented and/or low-income students and/or those who have graduated from Hayden Partner (i.e., low performing) high schools,¹¹ particularly students majoring in science, technology, engineering, and math (STEM) fields: [*Educational Opportunity Program*](#), [*Multicultural Engineering Program*](#), [*Student Support Services*](#), Partner’s Program, [*Louis Stokes Alliance for Minority Participation*](#), and others. The reach of these programs is limited, however, and expanding campus-wide efforts to strengthen a supportive environment is essential. As we have seen, our students highly value their educational experiences, but they may have some difficulty speaking up in class. On the 2008 NSSE, in response to whether they “asked questions in class or contributed to class discussions,” Cal Poly freshmen rated their performance about half way between sometimes and often (2.55 on a scale of 1-4, with 2 being sometimes and 3 being often, as compared with all CSU freshmen at 2.66 and all NSSE freshmen at 2.79); our seniors rated their performance as closer to often than sometimes (2.84 as compared with all CSU seniors at 2.92 and all NSSE seniors at 3.07). These results, while showing improvement between freshmen and seniors, suggest an area of further investigation and possible action if it appears that our students lack a sufficient sense of comfort and confidence to speak up in public settings.

1.5

As far as the broader question of student success is concerned, several academic support functions at Cal Poly have already been shown to have a broadly positive impact; two examples are the Study Session program and Supplemental Workshops in Science and Math. In keeping with our tradition of a robust co-curriculum, these are venues in which significant numbers of respondents report involvement on the Cal Poly Student Survey (35.1% in the Study Session program and 38.1% in Supplemental Workshops). In contrast, the 2008 NSSE painted a mixed picture of academic advising at Cal Poly. Our freshmen rated it as good, which was comparable to other cohorts (2.99 on a scale of 1-4, with 2 being fair and 3 being good, as compared with all CSU freshmen at 2.88 and all NSSE freshmen at 3.00); our seniors rated it as less than good but still comparable (2.70 as compared with all CSU seniors at 2.74). On the other hand, our freshmen report lower levels of faculty or advisor interaction regarding career-

2.12

related plans than other cohorts, which may be surprising given the preponderance of professional-degree programs at Cal Poly and the presence of the upside-down curriculum. They rated this kind of interaction as less than sometimes (1.84 as compared with all CSU freshmen at 2.03 and all NSSE freshmen at 2.19); seniors rated it as better than sometimes and comparable with the experience of other cohorts (2.36 as compared with all CSU seniors at 2.24 and all NSSE seniors at 2.42). Given this response, the university should focus on increasing effectiveness in both areas, including a commitment to faculty interaction with student career guidance and plans for integration in academic advising. Seeking integration of advising resources within each college and unit, as well as common standards across the many advising venues available to students, would serve their learning efficiency and potentially their timely progress to degree.¹²

The integration of academic policies that may impact student success, including those governing minimum progress requirements, change of major, course repeats, senior projects, etc., is also a key to improving student performance and graduation rates. For example, 19.4% of those who responded to the Cal Poly Student Survey have changed their majors and 23.6% would change if given the opportunity; this indicates the extent of a problem that has been recognized and addressed in the past but has so far proven extraordinarily difficult to solve. Many of our majors are very impacted; admission to these majors from either within or outside the university is highly competitive; and we want to prevent students from adopting a “back-door” strategy, that is, deliberately applying first to less competitive majors with the intent of seeking subsequently to change to the more competitive majors on which they had set their sights in the first place. Having clear, available information on change of major policies has been an important improvement on past practice; however, inconsistent policies between departments and colleges as well as overly demanding requirements in some cases remain a serious challenge for students with legitimate reasons for trying to change.¹³ 1.7, 1.8

We can also learn from other universities, and yet Cal Poly has long had a tendency to look inward that is aggravated by our relative isolation on the Central Coast. We need to become more attentive to the best practices of other institutions; these include a focus on learning outcomes in curricular planning, e-portfolio development, and curricular/co-curricular integration. Specific examples include UC Merced’s efforts to insure inclusion of program and university learning outcomes in all syllabi and course plans, as well as the expanding interest in using e-portfolios to promote student reflection, program assessment, and evidence-based decision making. We are learning from the e-portfolio experience of other institutions and making good progress in the implementation of the ULOs, but we are still saddled with a [syllabus policy](#) that does not require the inclusion of learning outcomes. This issue was the subject of vigorous debate in the Academic Senate when the policy was adopted in 2006; it deserves to be revisited by a new group of faculty.

Finally, student success is likely to be given a substantial boost as a result of the current provost’s insistence on giving all students a clear path to graduation and ensuring that the university does not have curricular requirements, policies, or procedures that prevent students from graduating in the four years usually advertised for an undergraduate degree. The introduction in Fall 2009 of block scheduling for entering freshmen and the use of more purposeful enrollment management tools are examples of recent steps intended to increase the efficiency with which we serve students. There are also plans to increase the intrusiveness of advising, to employ predictive scheduling, and to complete the introduction of an [online degree audit tool](#) allowing students to check on the status of their progress to degree. The latter is essential to their ability to successfully plan their careers at Cal Poly.

Integration & Student Learning Conclusion

In order for Cal Poly to more effectively prepare our students as capable and responsible citizens and professionals, the university must use its learning objectives to integrate student learning wherever it occurs—in GE, in the major, in the co-curriculum, or at work. We have many strengths on which to build, given the philosophical connection between the ULOs and CAS Standards, the ULO-based revision of the GE course outcomes, and many other examples of alignment. Furthermore, we must count our students among the riches of our capacity as they are well set to succeed. For the most part, they attend class regularly, are socially connected, and are comfortable with their major and college; most don’t commute, and the great majority of freshmen and sophomores live on campus as of AY 2009-10. Our residential environment thus offers us unique opportunities to more clearly connect our students’ whole life experiences; this should promote increased achievement of the objectives in the lower division. As an

example, the ULOs and DLOs were the focus of University Housing's student orientation in Fall 2009, with the goal of building an early understanding that these objectives represent core Cal Poly values.

The development of intentional connections between curricular and co-curricular programming along with a focus on the first-year experience will provide Cal Poly with many opportunities. On the 2008 NSSE, a significant number of seniors (65%) reported participation in community service or volunteer work; this interest is clearly an area upon which Cal Poly could develop intentional curricular linkages. Other applied learning experiences such as co-ops, internships, and study abroad provide our students with valuable opportunities for pre-professional growth, underscoring the importance of *intentional* connections between class work and these out-of-class experiences.¹⁴ Career preparation and academic success connect clearly to leadership development; studying the cohort of students who graduate in 2009 and following their professional development would provide Cal Poly with valuable information upon which to make future decisions, including important feedback about the value of students' curricular and co-curricular experiences in relationship to their careers. Cal Poly's recently acquired access to the expanded National Clearinghouse as of 2009 will make available key data regarding the lifelong learning and success of students who leave the university, whether by transfer or graduation.

Cal Poly's commitment to preparing our students for the challenges of the 21st century is clear. As the university continues to develop intentional linkages between GE, the major, and the co-curriculum, as well as between academic and work experiences, we will better meet the challenge of ensuring students' personal, professional, and intellectual growth. By engaging our students, offering them integrated learning opportunities, and furthering "a culture of inquiry and evidence" in the university, we will be setting the stage on which students can and will perform at a high level, achieving the university's learning objectives across the full spectrum of their experience.

Proposed Action Items

Integrate program review. The process is integrated in the sense that it seeks to assess learning across a broad range of venues—GE, the major, and the co-curriculum—for students within a program; structured work experiences like co-ops and internships should be added to the mix. The process may still be silo-ed to the degree that individual results are not aggregated. Program review should be used to assess learning at the university level and to ask university-level questions about the senior project, learn-by-doing, etc.

Integrate the university's intellectual capacity. Revise the mission statement to include staff as partners with students and faculty in the educational enterprise. Revise the syllabus policy to include the provision of course outcomes, with reference to ULOs and program goals. Revise the course form to include reference to ULOs among the course outcomes. Revise the senior project policy to insure 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 EER.

Integrate student learning and advising. Reaffirm our commitment to providing Cal Poly students with the opportunities to develop their skills in depth and breadth (the major and GE). Reaffirm the General Faculty's responsibility for GE within the curricular purview of the Academic Senate. Simplify the curriculum review process for GE courses. Continue to build awareness and application of the ULOs, DLOs, and SLOs. Make student work, especially on-campus employment and internships, an intentional and reflective learning experiences that is integrated with other academic experiences. Make the educational effectiveness of student work a focus of EER. Make the educational effectiveness of academic advising a focus of EER and the establishment of campus-wide advising standards an outcome. Help students to be more intentional and reflective about their learning by implementing the e-portfolio across campus. Integrate the e-portfolio into program review.

Conclusion

The experience of this self-study has been a humbling one for many of us who have worked on it. We are all professionals, experts in some discipline that is relevant to Cal Poly, and yet our expert knowledge does not generally encompass the whole university and its manifold operations. As a result, we have been stretched to develop our capacity for understanding the complexity of even a moderately sized institution of higher education. In the process, we have been able to make fruitful connections between different points of view, and it has been a genuinely gratifying experience to build up a shared knowledge of the issues posed by the four thematic essays.

The same could be said about our capacity for institutional research, which has been stretched to accommodate the needs of the self-study. On this campus, Institutional Planning and Analysis has traditionally been a compliance-oriented office that is preoccupied with satisfying the Chancellor's Office's appetite for reports. The situation has begun to change under the leadership of the current director, who has both the ability to and the interest in engaging in genuine institutional research. And yet the self-study raises the question of whether Cal Poly has the capacity to make this kind of investigation an ongoing enterprise that raises and answers fundamental questions about the university. Those of us who have worked on the self-study, who have been genuinely inspired and motivated by the process of inquiry and its implications for the campus, are hopeful that we do have this capacity and can maintain the effort to move from "convulsive" assessment, the fit or fever that periodically overtakes a program or institution, to the more moderate and satisfying experience of continuous improvement.

We remain convinced that each of the themes of this self-study address conflicts that lie deeply buried within our nature, conflicts that need to be addressed if we are to reach our full potential as a university. Are we comprehensive or polytechnic? Theorists or practitioners? Intellectuals or pragmatists? Teachers or scholars? Faculty or staff? Partisans of GE or the major? Each case represents a failure of imagination, both individual and institutional, and a persistent tendency to see the university and our place in it as either/or. This approach is too simplistic for an institution like Cal Poly, and all the essays point to the general need to develop a larger vision and a greater capacity for inclusive thinking on this campus. We are both comprehensive *and* polytechnic, intellectuals *and* pragmatists, teachers *and* scholars, faculty *and* staff working together to promote an integrated learning experience for all of our students.

This both-and view will require that we retreat somewhat from our history of granting colleges a high level of autonomy. This independence has its advantages (e.g., it may make the units accountable) but it also puts them into competition with each other; we have not so much a campus culture as a cluster of competing disciplinary cultures that are not easily reconciled. As a result, it is extremely difficult for us to develop and implement the kind of common policies that are called for in this self-study.

We also remain convinced that the themes of this self-study are valid ones, even in our presently reduced circumstances. What it means to be a polytechnic university in the 21st century, an effective place for learn-by-doing, an active teacher-scholar, an integrated institution that promotes the transfer of skills and reinforces the wholeness of the student experience—these are all valid and enduring issues that we can claim to have addressed but certainly have not fully resolved. This lack of resolution is evident in the appended comments on the self-study ([Appendix E](#)). We have seen some progress made even while this report was being produced and can point most significantly to the new strategic plan, which has taken the position that all our majors, whether they are in the professions or in the arts, sciences, and humanities, are to be considered polytechnic. This statement is a revolution on a campus where what it means to be polytechnic has been historically circumscribed. We would like to think that the strategic plan echoes the self-study's concern for integration.

Some have complained that we are already nearly a decade into the third millennium, and that we are well past the point where we should be wondering what it means to be a certain kind of institution in the 21st century. We would answer that the challenges are still out there waiting to be met, both for the university and the world in which it is situated, and that we still have more than 90 years to get it right.

Appendix A: Tables and Figures

Learn-by-Doing Figure 1

WASC - Learn by Doing: Question A.2 "Theoretical Perspectives"

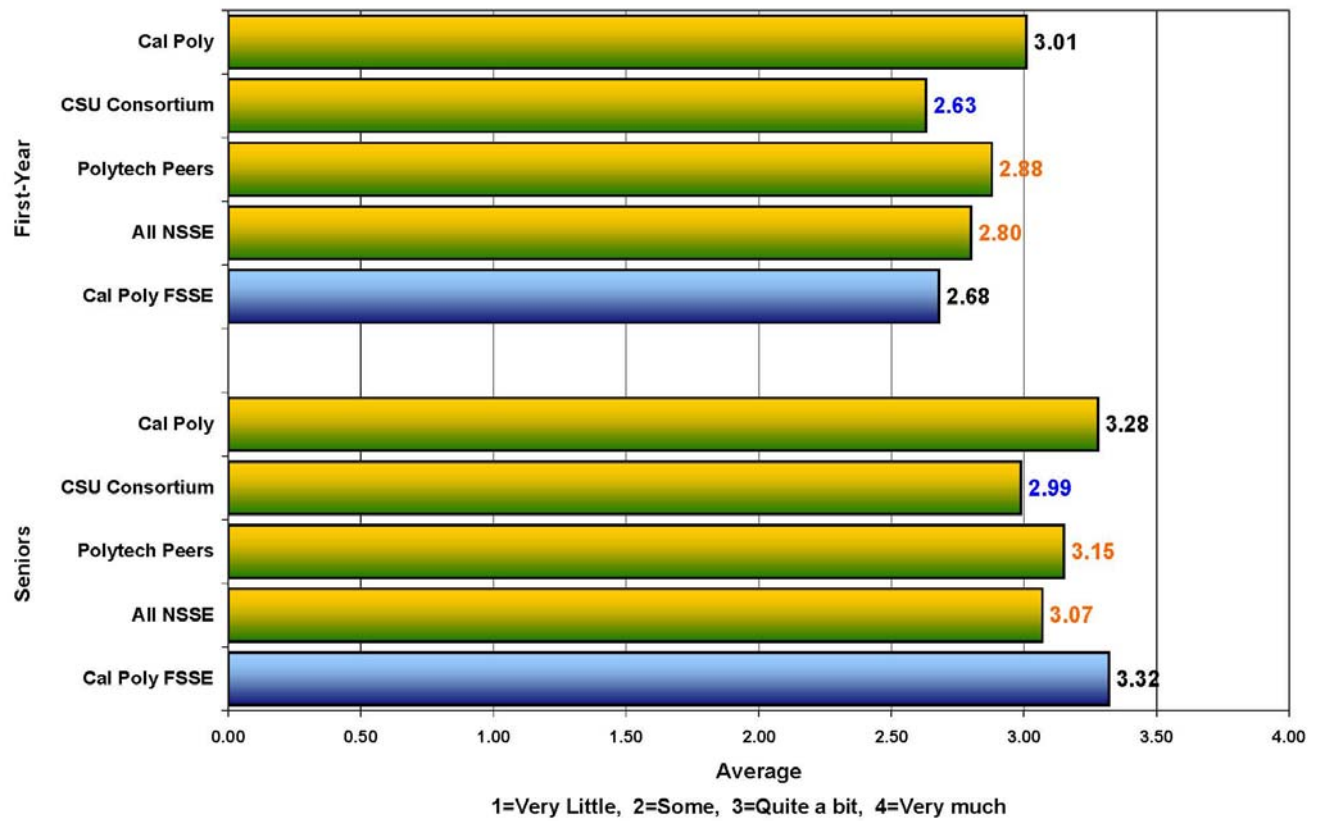
Item	Model	Author	Premise	Citation/Ref	Link1	Link2
1	"Experiential Learning Cycle": 4-stage spiral model	David A. Kolb	1. Concrete experience 2. Observation of and reflection on that experience 3. Formation of abstract concepts based upon the reflection 4. Testing the new concepts		http://wilderdom.com/experiential/elc/ExperientialLearningCycle.htm	
2	3-stage (simplified): Do, review, plan 4 stage: Impulse, Observation, Knowledge, Judgment	John Dewey	Continuity of experience. Learning as a dialectic process.	Dewey, J. (1938/1997). <i>Experience and education</i> . Macmillan.	http://wilderdom.com/experiential/Summary/JohnDeweyExperienceEducation.html	
3	Field Theory Action Planning	Kurt Lewin	Field Theory: behavior is a function of the person and his or her environment. Action Planning: a spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the result of the action	Kurt Lewin (1958). <i>Group Decision and Social Change</i> . New York: Holt, Rinehart and Winston.	http://wilderdom.com/theory/FieldTheory.html	http://www.web.net/~robrien/papers/arfinal.html
4	Cognitive vs. experiential learning	C. Rogers	Two types of learning: cognitive (meaningless) and experiential (significant)	Rogers, C.R. (1969). <i>Freedom to Learn</i> . Columbus, OH: Merrill.	http://tip.psychology.org/rogers.html	http://findarticles.com/p/article/s/mi_qa4089/is_200311/ai_n9324277
5	Theory of cognitive development	Jean Piaget	Stages of understanding in children show complexities of learning		http://www.learningandteaching.info/learning/piaget.htm	
6	"Praxis", Critical Pedagogy	Paulo Freire	Praxis is a synthesis of theory and practice in which each informs the other.		http://marxists.anu.edu.au/subject/education/freire/pedagogy/index.htm	
7	General				http://www.experientiallearning.ucdavis.edu/tlbx-links.shtml	

Learn-by-Doing Figure 2

2008 NSSE/FSSE Survey Results

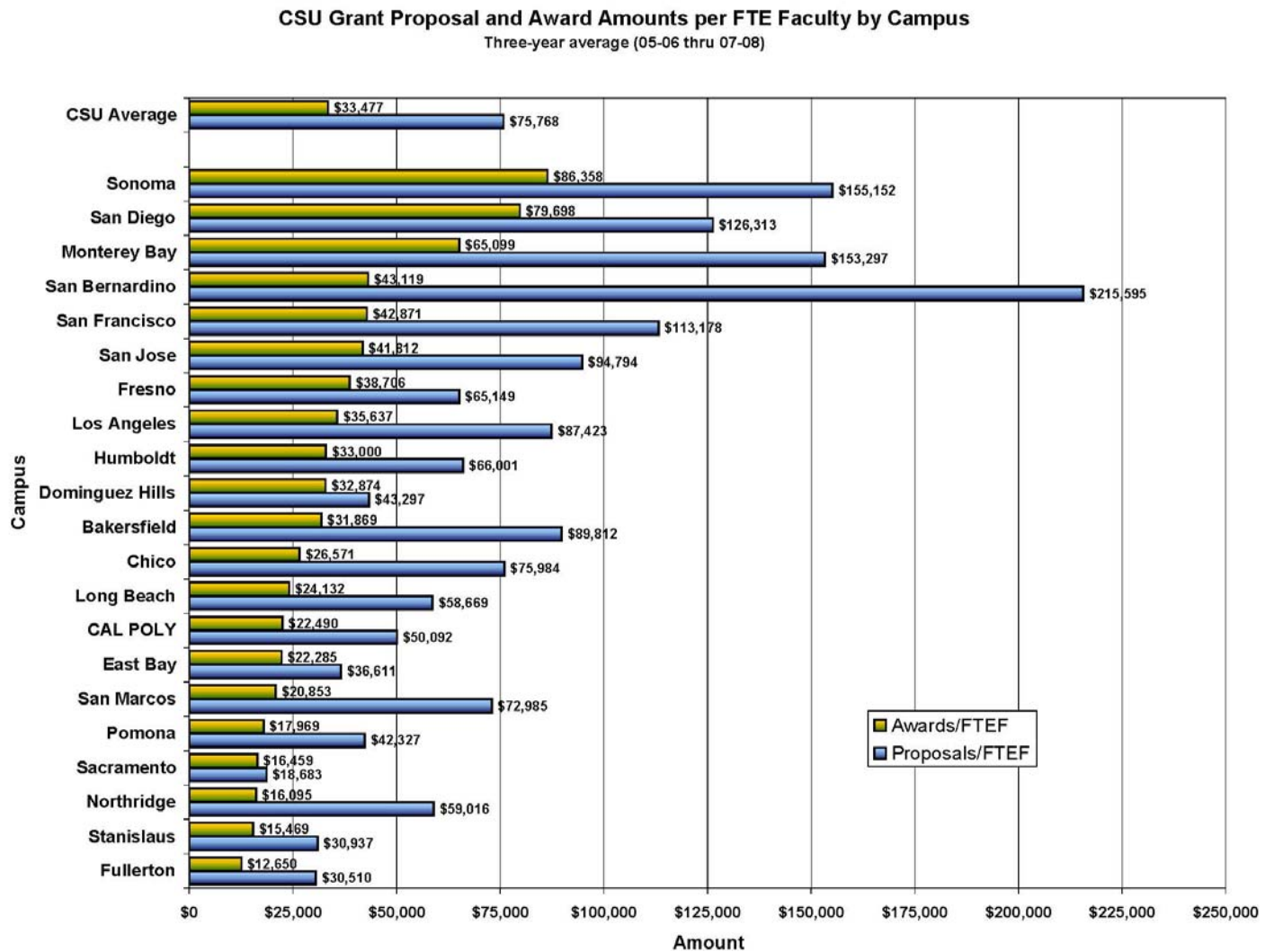
To what extent - has your (NSSE)/has the typical student's (FSSE) - experience at this institution contributed to your/their knowledge, skills, and personal development in acquiring job or work-related knowledge and skills?

Colored values are statistically significant from Cal Poly's average (p < .001 two tailed). Values in orange have a small effect size and values in blue have a medium effect size. Significance is not calculated for FSSE averages.



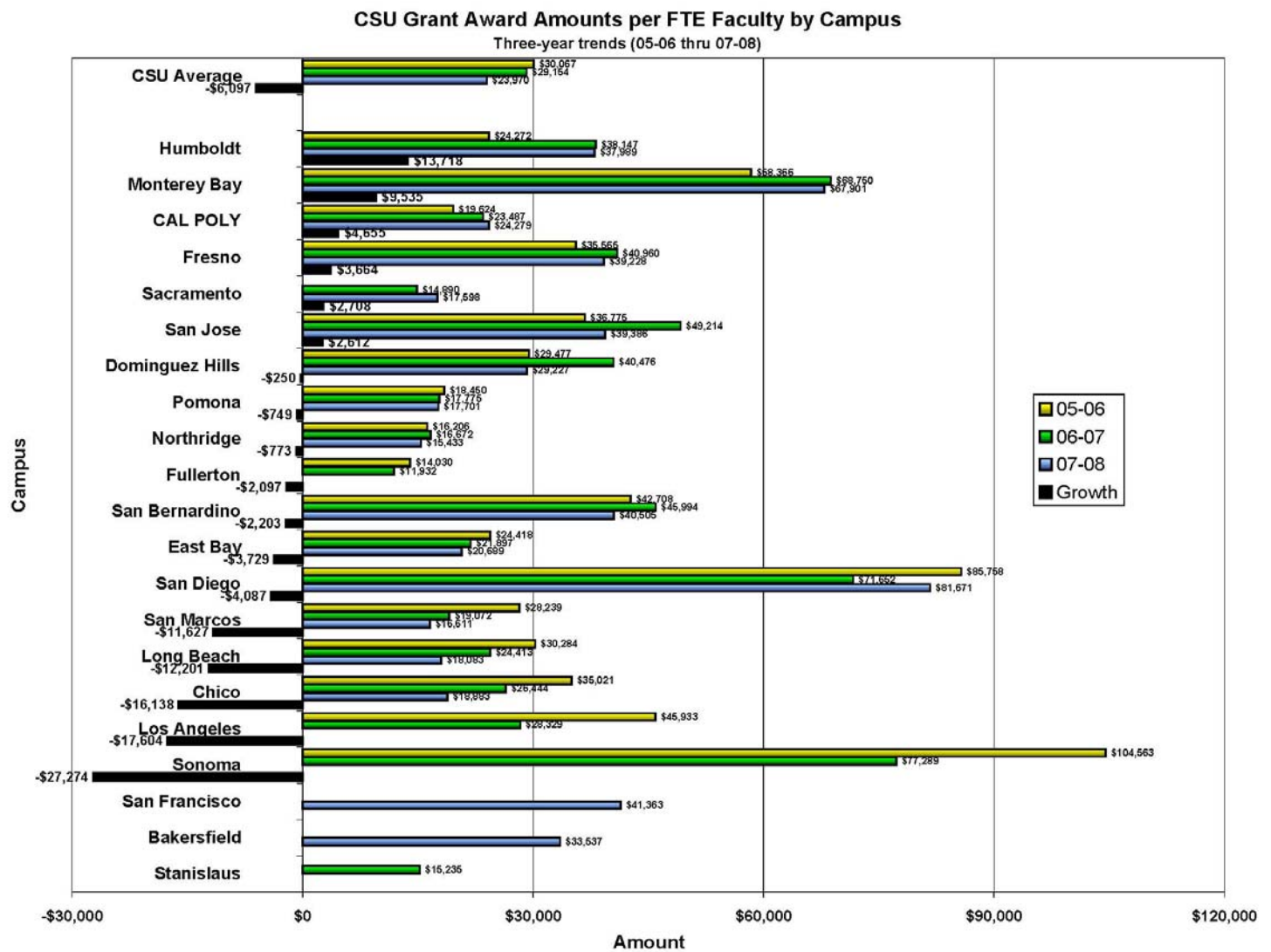
Source: IP&A, BSG, 11/12/09

Teacher-Scholar Model Figure 1



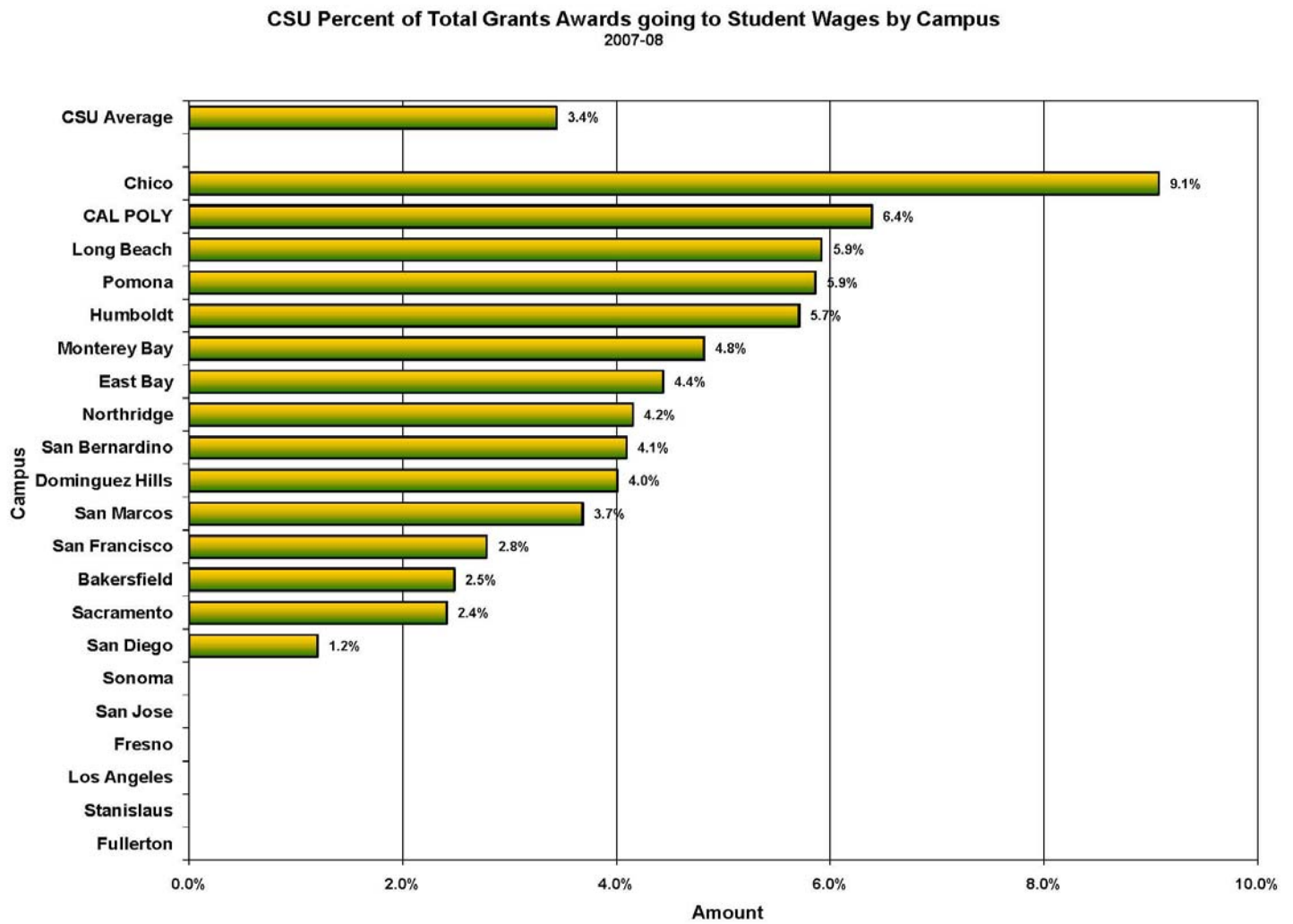
Source: IP&A, BSG, 11/13/09

Teacher-Scholar Model Figure 2



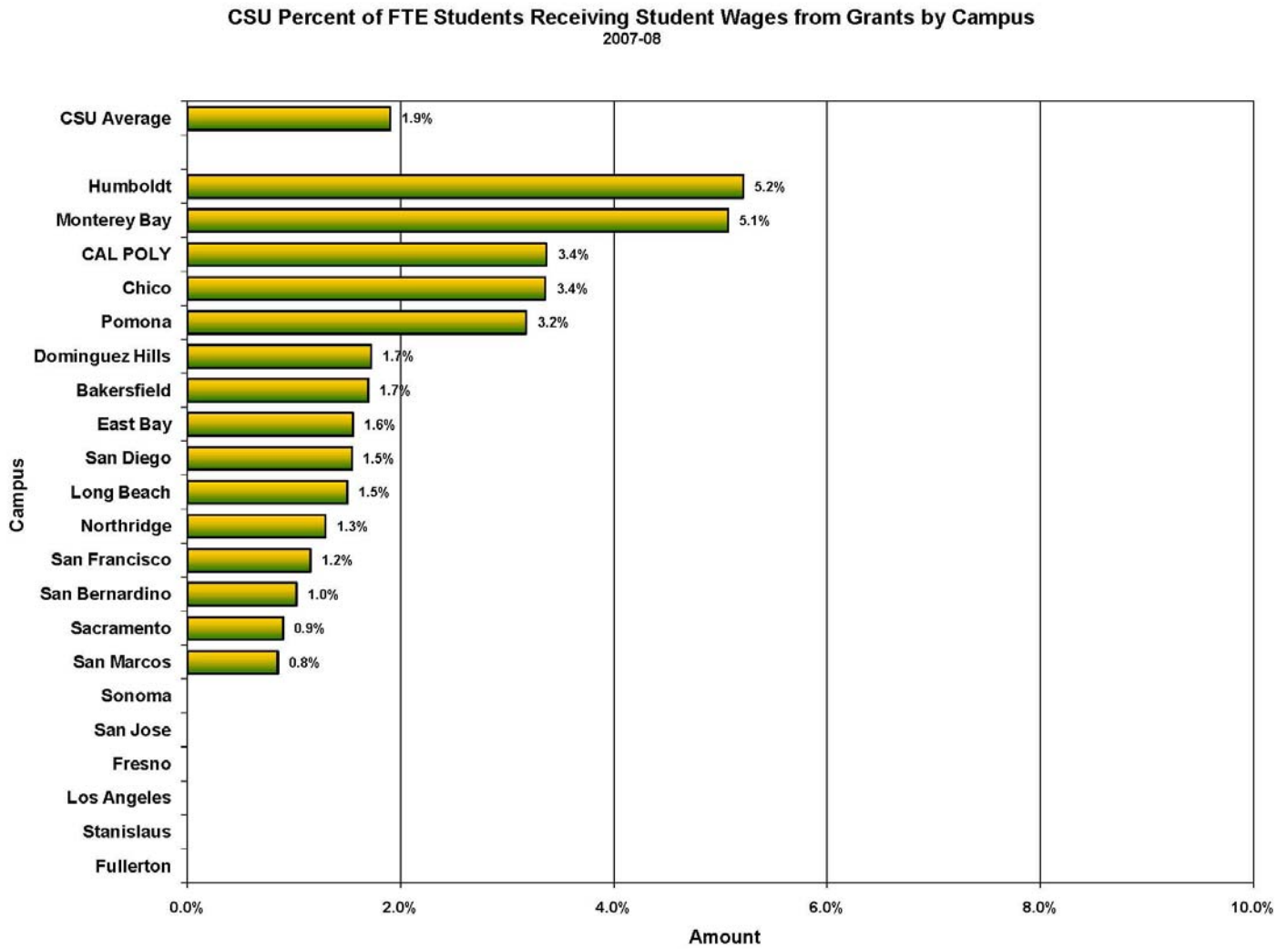
Source: IP&A, BSG, 11/13/09

Teacher-Scholar Model Figure 3



Source: IP&A, BSG, 11/13/09

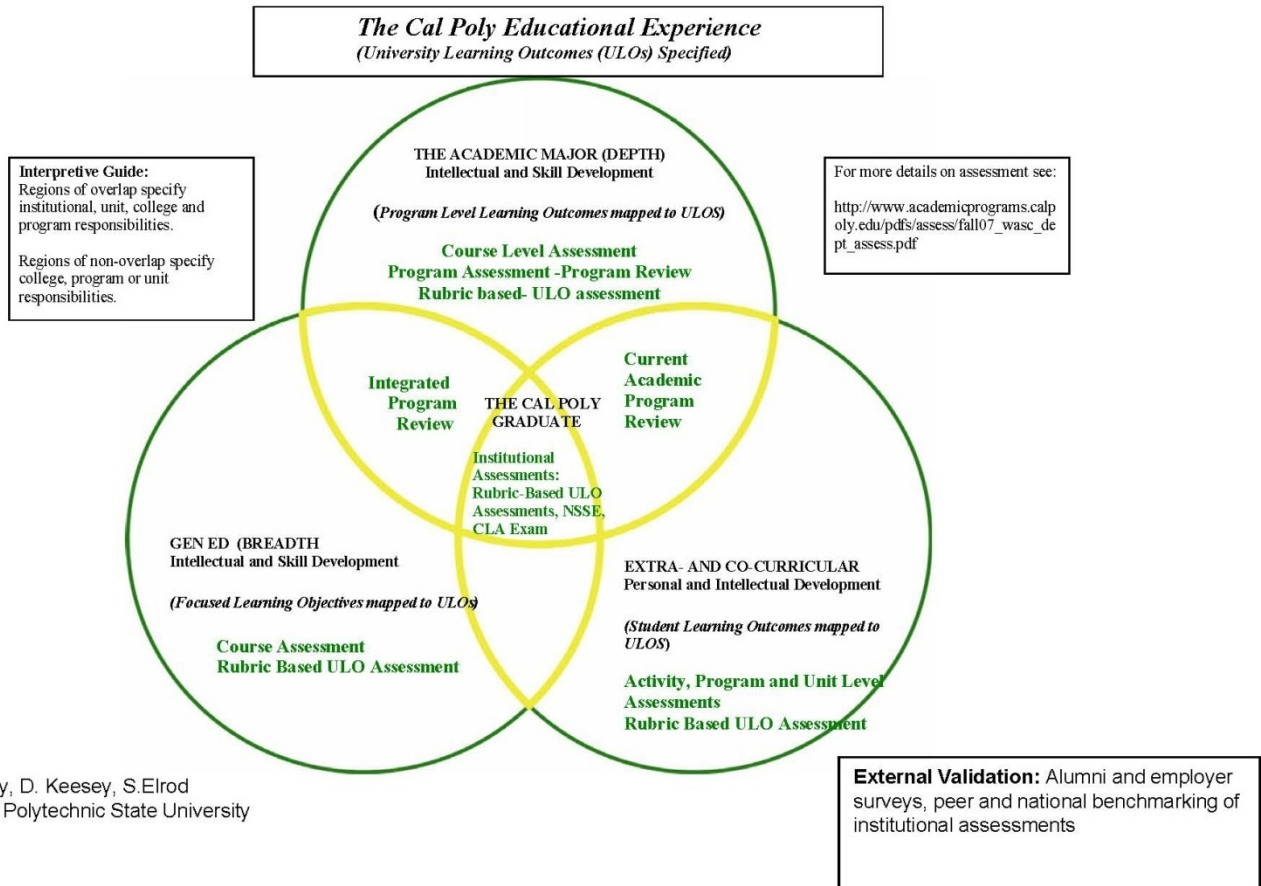
Teacher-Scholar Model Figure 4



Source: IP&A, BSG, 11/13/09

Integration and Student Learning Figure 1

Where does student learning and its **assessment** occur?



Appendix B: Endnotes

Introduction

¹ The student survey was broken into two instruments, one focusing on the University Learning Objectives, one focusing on the Diversity Learning Objectives and other areas of interest to the working groups. The response rate on the student survey addressing the University Learning Objectives was 16.5%, on the student survey addressing the Diversity Learning Objectives 16.9%, and on the faculty/staff survey 27.3%. These results can be found in [Appendix L](#) and [Appendix M](#) on p. 7 of each Preliminary Report.

Our Polytechnic Identity

¹ This effort later informed the selection of a comparison group for strategic planning purposes.

² University of Delaware Diversity Task Force, “The Path to Prominence through Diversity: University of Delaware Diversity Task Force Final Report,” University of Delaware, <http://www.udel.edu/aboutus/diversity-finalreport.pdf>.

³ California Polytechnic State University, “Cal Poly Strategic Plan – v7,” p. 5, http://www.academicaffairs.calpoly.edu/StrategicPlan/support_materials/SPv7_11-10-09.pdf.

⁴ Unfortunately, the question was not asked consistently in all surveys. In the faculty/staff survey, 58.4% of respondents agreed or strongly agreed with the statement “I am aware of Cal Poly’s University Learning Objectives.” 49.7% agreed or strongly agreed with an equivalent statement about the Diversity Learning Objectives; additional analysis yields a better result among those who are expected to engage in scholarly activity. In the Student Survey, 34.6% of respondents agreed or strongly agreed with the statement “I am aware of Cal Poly’s Diversity Learning Objectives.” Students were not polled on the University Learning Objectives. These results can be found in [Appendix M](#) on pp. 20 and 24 and in [Appendix L](#) on p. 254 of the Diversity Learning Objectives Survey Preliminary Report.

⁵ Data from [National Center for Education Statistics’ Academic Libraries Survey Database](#) from fiscal year 2006, which was the latest available when this report was being researched. Data are now available from fiscal year 2008 but have not yet been analyzed.

⁶ Cal Poly ranks third in the nation for study abroad in the category of master’s institutions. A total of 877 Cal Poly students studied abroad in 2007-08. Institute of International Education, “Open Doors 2009 Report on International Educational Exchange,” Table 28B, <http://opendoors.iienetwork.org/?p=150842>.

Learn-by-Doing

¹ Robert E. Kennedy, *Learn by Doing: Memoirs of a University President: A Personal Journey with the Seventh President of California Polytechnic State University* (San Luis Obispo: Cal Poly Foundation, 2001), 5-6, 227-29.

² California Polytechnic State University, “WASC Self-Study 2000,” http://www.academicprograms.calpoly.edu/accred_progrev/wasc/context/context.html.

³ Ibid.

⁴ Cal Poly University Advancement, “Why Give to Cal Poly,” Giving, http://giving.calpoly.edu/why_give.html.

⁵ [Appendix S](#): Learn-by-Doing Department Chair/Head Survey Results, p. S13.

⁶ [Appendix Q](#): Strategic Plan Project-Based Learning Workgroup PowerPoint presentation, slides 15-33.

⁷ [Appendix L](#), Diversity Learning Objectives Survey Preliminary Report, pp. 21, 26. The University Learning Objectives Survey Preliminary Report yielded similar results. Data from the 2008 NSSE indicates that 61% of Cal Poly students will have had similar experiences by the time they graduate. See Appendix N, NSSE Frequency Distributions, p. 21, question 7a.

⁸ [Appendix L](#), Diversity Learning Objectives Survey Preliminary Report, pp. 27, 31. The most recent Alumni Survey indicates greater involvement in academic clubs as well as professional and career-related activities on the part of Cal Poly students extending back many years but provides no direct evidence of the value alumni attach to such experiences. See Appendix O: Results from the 2008 Alumni Attitude Study, e.g. slide 79.

⁹ Engineers Without Borders, “Projects,” Civil and Environmental Engineering, <http://ceenve3.civeng.calpoly.edu/ewb/Projects.htm>.

¹⁰ Sustainable Agriculture Resource Consortium, “History,” <http://www.sarc.calpoly.edu/about/history.html>; Sustainable Agriculture Resource Consortium, “Organic Farm,” http://www.sarc.calpoly.edu/programs/organic_farm.html.

¹¹ Cal Poly History Department, “Phi Alpha Theta – The Forum,” <http://cla.calpoly.edu/hist/pat/forum.html>.

¹² Appendix N, NSSE08 Frequency Distributions, p. 22, question 9d.

¹³ California Polytechnic State University, “Cal Poly Strategic Plan – v7,” http://www.academicaffairs.calpoly.edu/StrategicPlan/support_materials/SPv7_11-10-09.pdf, p. 5.

¹⁴ [Appendix L](#), Diversity Learning Objectives Survey Preliminary Report, p. 189.

¹⁵ Appendix N, NSSE08 Mean Comparisons, p. 9, question 11b.

¹⁶ Appendix O, slides 74-76.

- ¹⁷ [Appendix L](#), Diversity Learning Objectives Survey Preliminary Report, p. 188.
- ¹⁸ [Appendix R](#): Team 1 Business 418 Listening to the Consumer PowerPoint presentation, especially slides 7 and 9.
- ¹⁹ [Appendix M](#), pp. 119, 120.
- ²⁰ Interviews with participants in College of Science and Mathematics 302 The Learn By Doing Lab Teaching Practicum conducted by Tom Trice during Spring 2009.
- ²¹ [Appendix L](#), University Learning Objectives Survey Preliminary Report, pp. 122-57. Though the major lags behind general education by less than a percent in responses regarding the diversity ULO, the difference is significant when considered in relation to the major's importance for achievement of all other ULOs.
- ²² [Appendix M](#), pp., 88 and 22, respectively.
- ²³ Appendix N, NSSE Mean Comparisons, pp. 3,4,6,8, questions 1e, 1u, 1v, 6e, 10c.
- ²⁴ [Appendix L](#), Diversity Learning Objectives Survey Preliminary Report, pp. 256, 259, 262, and 262.
- ²⁵ [Appendix L](#), Diversity Learning Objectives Survey Preliminary Report, pp. 181; [Appendix M](#), p. 88.
- ²⁶ [Appendix L](#), Diversity Learning Objectives Survey Preliminary Report, pp. 181, 256, 259, 262, and 265; [Appendix M](#), p. 88.

Teacher-Scholar Model

- ¹ California Education Code Section 66010.4 states "Research, scholarship, and creative activity in support of its undergraduate and graduate instructional mission is authorized in the California State University and shall be supported by the state."; Cornerstones Task Force, "The Cornerstones Report: Choosing our Future," California State University, http://www.calstate.edu/cornerstones/reports/cornerstones_report/, Principle 4; CSU Provosts, "The Role of Research, Scholarship, and Creative Activities in the CSU: Provosts' Statement and Recommendations," The California State University, http://www.calstate.edu/acadaff/System_Strategic_Planning/docs/ResearchScholarshipActivities-acc.pdf.
- ² George Kuh, *High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter* (Washington, D.C.: American Association of Colleges and Universities, 2008); Ernest T. Pascarella and Patrick T. Terenzini, *How College Affects Students, A Third Decade of Research, Volume 2*, (San Francisco, CA: Jossey-Bass, 2005).
- ³ CSU Provosts, "The Role of Research, Scholarship, and Creative Activities in the CSU: Provosts' Statement and Recommendations," The California State University, http://www.calstate.edu/acadaff/System_Strategic_Planning/docs/ResearchScholarshipActivities-acc.pdf.
- ⁴ [Appendix L](#), Diversity Learning Objectives Preliminary Report, pp. 228-253; [Appendix M](#), p. 134.
- ⁵ Ernest Boyer, *Scholarship Reconsidered: Priorities of the Professoriate* (New York: Jossey Bass, 1997); KerryAnn O'Meara & R. Eugene Rice, *Faculty Priorities Reconsidered: Rewarding Multiple Forms of Scholarship* (New York: John Wiley & Sons, 2005); John Braxton and Marietta Del Favero, "Evaluating Scholarship Performance: Traditional and Emergent Assessment Templates," *New Directions for Institutional Research*, 2002, no. 114: 19-32.
- ⁶ Ernest Boyer, *Scholarship Reconsidered: Priorities of the Professoriate* (New York: Jossey Bass, 1997). Boyer's four types of scholarship are summarized in [Appendix T](#).
- ⁷ [Appendix U](#): Teacher-Scholar Model Department Chair/Head Survey Results, p. U21.
- ⁸ [Appendix M](#), pp. 30, 129.
- ⁹ [Appendix U](#), pp. 11-14.
- ¹⁰ Center for Teaching and Learning, "Center for Teaching and Learning Mission Statement," <http://www.ctl.calpoly.edu/>.
- ¹¹ Appendix V: Collaborative on Academic Careers in Higher Education Survey Results, pp. 581-582.
- ¹² Data from [National Center for Education Statistics' Academic Libraries Survey Database](#) from fiscal year 2006, which was the latest available when this report was being researched. Data are now available from fiscal year 2008 but have not yet been analyzed.
- ¹³ [Appendix U](#), p. U15
- ¹⁴ [Appendix M](#), p. 150.
- ¹⁵ Appendix V, p. 33.
- ¹⁶ [Appendix M](#), p. 144.
- ¹⁷ George Kuh, *High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter* (Washington, D.C.: American Association of Colleges and Universities, 2008).

Integration & Student Learning

- ¹ Now the School of Education in the College of Science & Mathematics.
- ² American College Personnel Association, *Student Learning Imperative: Implications for Student Affairs*, 1996, http://www.myacpa.org/sli_delete/sli.htm.
- ³ Margaret J McKeon, "The integration of mission in the co-curriculum: A case study of Messiah College" (January 1, 2006), *Dissertations from ProQuest*, Paper AAI3209976, <http://repository.upenn.edu/dissertations/AAI3209976>.
- ⁴ Ernest T. Pascarella and Patrick T. Terenzini, *How College Affects Students, A Third Decade of Research, Volume 2*. (San Francisco: Jossey-Bass, 2005), 602.

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- ⁵ A mean of 2.31 reported for Cal Poly freshmen compared to 1.91 within the CSU, and a mean of 2.47 reported for Cal Poly seniors compared to 1.75 in the CSU where 2=1-5 hrs./wk. and 3=6-10 hrs./wk. Appendix N, Mean Comparisons, p. 8, question 9d.
- ⁶ The student survey was conducted in Winter 2009, just two years after the ULOs were approved; if it were administered today, we would expect improved results from an extensive ULO awareness campaign conducted in Spring 2009. Faculty and staff are also becoming more aware of the ULOs, in part due to the call for alignment in program review.
- ⁷ CSU policy regarding GE structure is set forth in [EO-1033 General Education Breadth Requirements](#); Cal Poly [AS-472-97/gebadhoc Resolution on General Education and Breadth Program: Proposed Administrative Structure](#).
- ⁸ Appendix N, Frequency Distributions, p. 20, question 7a; [Appendix L](#), University Learning Objectives Preliminary Report pp. 48, 53, 60, 62, 66, 68, 94, 99, 111, 114, 119, 121, Diversity Learning Objectives Preliminary Reports pp. 46, 50, 57, 59, 63, 68, 91, 99, 109, 114, 117, 121; [Appendix M](#), p. 18.
- ⁹ Appendix N, Mean Comparisons, p. 10, question 11k.
- ¹⁰ [Appendix L](#), Diversity Learning Objectives Preliminary Report, p. 254.
- ¹¹ These are schools that appear on a list originally compiled at the request of State Senator Tom Hayden.
- ¹² [Appendix L](#), both Preliminary Reports, p. 27; Appendix N, p. 10 question 12, p. 4 question 1o.
- ¹³ The Academic Senate has addressed this issue in the past with [AS-582-02/IC Resolution on Process for Change of Major](#). Despite a statement in the [catalog](#) that “transfer from one major to another cannot be guaranteed,” some students and their parents inquire about making a change even before starting their first quarter at Cal Poly. A group of associate deans and others is currently working with the Vice Provost for Academic Programs and Undergraduate Education to clarify and standardize change of major policies.
- ¹⁴ D. Schoem, “Transforming Undergraduate Education: Moving Beyond Distinct Undergraduate Initiatives,” *Change*, (Nov-Dec. 2002), pp. 50-55, <http://www.jstor.org/>; Association of American Colleges and Universities, *College Learning for the New Global Century: Executive Summary*, 2008, pp.10-14, http://www.aacu.org/advocacy/leap/documents/GlobalCentury_ExecSum_final.pdf.