

Adopting Sustainability Goals and Practices at a Polytechnic University: Opening Chapters of a Cultural Story*

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INTRODUCTION

Warren J. Baker, President of California Polytechnic State University in San Luis Obispo, signed the Talloires Declaration on April 23, 2004. Adopting this formal statement represents a symbolic achievement and an endorsement of work in progress. As individuals with leadership and operational roles at Cal Poly we think it is important to tell our story from the perspectives of different university cultures. We start by providing some background about our institution, its mission and its physical setting, and its role within the California State University system. Next, we highlight some of the key activities and events that contributed to the decision to sign the Talloires Declaration. Finally, applying our cultural framework, we look ahead to the opportunities and challenges we face in implementing the Talloires commitments.

THE SUSTAINABILITY TRIANGLE AND UNIVERSITY CULTURE

The literature on environmental responsibility is replete with metaphors and graphic images that depict balance among three elements: environment, economy, and equity. All of these reflect a response to early criticisms of the environmental movement in the United States that advocates appeared to ignore the economic and social consequences of environmental protection. Thus, definitions of sustainable development now emphasize that a community must be able to meet the principle of intergenerational equity.¹

If environmental values are not accounted for, then the basic life support process on which a community depends cannot be sustained. If economic development values are not represented, then the fundamental source of community change and improvement is denied. If social values are not reflected in a plan, then places will be created that do not meet the life and work needs of local people and do not fairly serve all interest groups.²

Formulations include the “3 E’s,” the “three-legged stool,” the “triple bottom line,” triangles that reflect the graphic symbol for recycling, and a moebius strip. Figure 1 shows one representation of the triangle.³

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¹ World Commission on Environment and Development (WCED), *Our Common Future* (Oxford, UK: Oxford University Press, 1987).

² Philip R. Berke, Does Sustainable Development Offer a New Direction for Planning? Challenges for the Twenty-First Century, *Journal of Planning Literature* 17 (2002), p. 31.

³ Scott Campbell, Green Cities, Growing Cities, Just Cities? *Journal of the American Planning Association* 62_(1996), p. 298.

[PLACE FIGURE 1 ABOUT HERE.]

When we apply concepts regarding environmental sustainability to higher education, additional factors come into play because of the particular mission and distinct cultures of colleges and universities. Analysts of campus culture contrast the roles, responsibilities, and relationships of students, faculty and administrative support staff.⁴ The relationships can be depicted as in Figure 2, showing how administrative functions (which must be fiscally responsible and operationally efficient) support the educational mission – which consists of knowledge development and teaching (primarily the realm of faculty) and maturation and learning (the focus of students).

[PLACE FIGURE 2 ABOUT HERE.]

University governance and administrative structures reflect different cultures within higher education. The organization chart may show a vertical structure wherein vice presidents oversee divisions with directors and deans to manage operations. However, the principles of consultation and collegiality overlay this structure, whereby faculty maintain control over curriculum and academic quality standards, and communicate directly with university leadership through electoral bodies such as academic senates. Student participation in governance forms another layer, again through electoral processes and structures that do not fall within the organizational hierarchy. In some instances, labor unions or other representative organizations speak for support staff. Overall, these collegial and consultative processes function outside the administrative divisions of the university.

Absent interest in natural resources and the environment, members of the different cultures interact in predictable ways. Students complain about the quality of food or prices of books. Administrative offices seek to provide “student-friendly” registration procedures. Faculty advise students about their futures, or call for more efficient purchasing practices. Researchers and technicians are concerned with the disposal of experimental materials. Space planning staff and consultants involve user committees in programming new facilities.

Introducing environmental responsibility not only presents new issues for faculty, students and staff to consider, but also initiates rethinking of relationships. As shown in Figure 3, we depict this in the form of the sustainability triangle, but inverted to dramatize its initially destabilizing effect on all three cultures. Adding the environmental apex forces a more overt relationship between the other two points of the triangle because it introduces intellectual and value-based expectations about both education and operations, calling for change in both.

[PLACE FIGURE 3 ABOUT HERE.]

⁴ George D. Kuh, and Elizabeth J. Whitt, *The Invisible Tapestry: Culture in American Colleges and Universities* (Washington, DC: ASHE-ERIC, Higher Education Report No. 1, 1988).

Each group responds within the context of its culture. While administrators may be very interested in efficiencies offered by environmentally sensitive practices, they are also more constrained by their managerial culture and institutional roles than faculty and students. Indeed, the relatively independent role of faculty enables them to respond intellectually. As political scientist Benjamin Barber noted when given the opportunity to advise President Bill Clinton:

I told myself, I was still an outsider, an autonomous intellectual here voluntarily, ... We were not paid a cent. Said what we thought. We could all stay or go.⁵

It is not surprising, then, that faculty (and students) have assumed more visible roles in calling for environmentally responsible actions while administrators have more quietly adopted such practices when they are fiscally prudent and operationally efficient. Nevertheless, all three cultures also face challenges associated with behavioral change. Are students willing to give up driving to most of their destinations (especially in California)? Are faculty prepared to modify their own commuting behavior? Are departments interested in integrating environmental responsibility within the entire curriculum? Are researchers intrigued by the technical challenges of designing less resource-intensive equipment? Are administrative staff able to alter purchasing standards to facilitate procurement of less environmentally-damaging materials and services?

Cal Poly experiences these cultural tensions and faces these behavior challenges as we explore our leadership role in sustainable futures.

BACKGROUND

Cal Poly's founders stressed the connections among economic development, social imperatives and land stewardship, and between education and operations in what was then a remote farming area of California half way between San Francisco and Los Angeles. In 1901 the State Legislature allocated funds to found a school that would complete the ingredients of successful town planning at the time: "the triumvirate of industry, agriculture and education."⁶ The polytechnic school would train future farmers and skilled workers, import state-of-the-art techniques of production, and elevate the cultural level of its rough and tumble surroundings.

The practice of agriculture and training of agriculture teachers were central to the college's mission of serving the needs of the local community.⁷ Cal Poly's longest-serving President, Julian McPhee, and his followers aggressively increased enrollment and acquired acreage upon which students could apply the University's motto, "Learn by Doing." Students completed agricultural activities as "enterprise projects," for which they could earn not only credit but a financial return. This hands-on learning model, involving use and management of the college's land and capital resources and integrating students into the local marketplace, extended to students in subsequently added colleges

⁵ Benjamin R. Barber, *The Truth of Power* (NY: W.W. Norton, 2001), p. 43.

⁶ Steven Marx (ed.), *Cal Poly Land: A Field Guide* (San Luis Obispo, 2002), p. 147.

⁷ *Ibid.*, p. 153.

of Architecture and Environmental Design, Business, Education, Engineering, Liberal Arts, and Science and Mathematics.

The university's 10,000 acre land holdings remain an invaluable asset for educational programs in all colleges; and land use planning and stewardship have become sites of inquiry, contention, and in some cases, classroom study.

Cal Poly was integrated in the California State University (CSU) system when the California legislature adopted a Master Plan for Higher Education in 1961. Thus, the CSU Board of Trustees is the governing authority for the campus with respect to both academic programs and administrative operations. Further, as a public institution the CSU (and thereby Cal Poly) is subject to state policy and funding practices. One example of this is that General Obligation bonds fund instructional facilities while state appropriations fund operating budgets, limiting the ability of campuses to realize the benefits of life-cycle cost analysis. Also, the CSU prioritizes projects based on program and size standards related to enrollment and utilization. The State does not currently allow the use of the capital funds for the administrative costs involving Leadership in Energy and Environmental Design (LEED) certification.

On the other hand, the CSU has encouraged energy conservation by allocating major capital funding for projects that reduce energy consumption and replace aging infrastructure. In 2001 CSU Executive Order 917 established the goal to reduce energy consumption by 15 percent by the end of the 2004/05 fiscal year, as compared to 1999/2000. CSU campuses have done so by replacing energy-consuming lighting, installing more efficient heating/cooling systems and paying attention to "daylighting."

Two representatives from Cal Poly participated actively on the CSU Committee for the Development of Sustainable Design Policy, formed in 2001 to establish standards for all campuses. One of the first outcomes was a major modification in 2004 to Executive Order No. 917, adding sustainable building practices to previous operational provisions. The committee is now incorporating sustainability measures into the design guidelines for CSU capital projects.

In order to implement State and CSU energy conservation policies, Cal Poly appointed an energy/utilities manager in the early 1990's, one of the first in the system. Also, in the mid 1990's Cal Poly undertook a bond-funded project to upgrade campus utilities. This project replaced electrical transformers and the main electrical distribution lines, and built a new electrical substation which resulted in major energy reductions on campus. At the same time, the campus upgraded the central heating and cooling plant with new energy efficient boilers, chillers and a new hot and cold water distribution system. A key to Cal Poly's success in energy savings is its central energy management system, which controls a majority of the HVAC systems in campus buildings.

In 2000-01 Cal Poly initiated a campus-wide lighting retrofit project which replaced both interior and exterior lighting. The Lease Revenue Bonds for this project, which has also

improved the quality of campus lighting, will be paid back through the monthly savings in the electric bill (expected by 2009).

Cal Poly's waste diversion program includes beverage containers, cardboard, glass, newspapers, office papers, plastics, scrap metal, on-site composting/mulching, food waste, tires, concrete, and asphalt. In 2003, 7.9 million tons were diverted of the 10.5 million tons of waste generated. This is a 75 percent recycling rate. (This does not include construction projects, which are now expected to recycle 50 percent of construction waste.)

PRECURSORS TO THE TALLOIRES SIGNATURE

In 1997 Cal Poly initiated the first major revision of its campus master plan in thirty-five years. The administration began with strategic academic planning and invited campus and community members who had previously criticized University planning to join task forces charged with identifying issues that the new master plan should address. Two groups that provided significant input into principles and policies that reflected environmental responsibility were the Natural Environment Task Force and the Built Environment and Technology Task Force. One value incorporated in the plan stated that Cal Poly should be "an environmentally responsible campus that demonstrates high regard for biodiversity as well as energy and resource conservation and long-term sustainability."⁸

At roughly the same time, the Provost invited members of the faculty to participate in the Provost's Forum on Education and the Environment. The first session attracted more than thirty faculty from as many departments, almost all of whom had been active in local environmental causes. The following year, the Provost selected three proposals for faculty seminars that would lead to action programs. One of these, exploring the natural history, human history, technology, aesthetic and recreational resources of the University's land holdings, led to the creation of the Cal Poly Land website, interdisciplinary general education course, and book.⁹ The seminar included members of the administration, such as the energy/utilities manager, environmental consultant, and executive vice provost, several of whom contributed sections to the website and book, and regularly lecture to the class.

[PLACE FIGURE 4 ABOUT HERE.]

Many faculty members in Architecture and Environmental Design had long been teaching sustainability principles in individual classes, and the College developed a minor to encourage students in many departments to pursue this interest. In Fall 2001, a group of students involved in the Associated Student, Incorporated (ASI), organized the Campus Sustainability Initiative (CSI), which brought together students, faculty, and staff

⁸ Cal Poly, *Master Plan and Environmental Impact Report* (San Luis Obispo, CA, 2001), p. 4. See also, <http://www.facilities.calpoly.edu>

⁹ See <http://polyland.lib.calpoly.edu/flash.html>

for weekly meetings to exchange information and discuss issues pertaining to curriculum, planning and operations.

This informal group co-sponsored a visit to the campus by Amory Lovins in March of 2002. The event, entitled “Sustainability and the Future of the Polytechnic University,” received support from the Provost’s Office, five college deans, and the President’s Office, which designated it an official Centennial Celebration project. Following this event, a delegation of faculty, administration and students approached the President asking him to sign the Talloires Declaration. He agreed in principle but asked that the Academic Senate approve the provisions involving instruction.

MAKING THE COMMITMENT

During the 2002-03 year both the Academic Senate and the ASI passed resolutions urging the Cal Poly President to sign the Talloires Declaration. In responding to the Senate resolution, President Warren Baker cited the environmental values espoused in the Master Plan and enumerated some campus activities already in place that implement provisions in the Declaration. In agreeing to sign the Declaration, President Baker underscored the balance required:

While each of these initiatives is charged with a particular focus, we expect them to work together in order to balance our educational efforts. Thus, our concerns with fostering student progress and diversity go hand in hand with academic quality. Similarly, our concern with the physical environment stresses instructional needs, safety and cost, as well as aesthetics and environmental responsibility.¹⁰

Consciousness of sustainability principles and their appropriateness to Cal Poly’s mission and identity continued to grow during the 2003-04 academic year. In order to make sure that the campus was informed as to what is being done with respect to energy conservation and sustainable practices, Facilities Planning and Capital Projects established a sustainability website in 2003. The goal of this website is to educate, inform, update and seek input from Cal Poly faculty, staff and students, and from interested community members. Facilities Planning and Capital Projects also added a sustainability coordinator in 2004 to work with the campus energy/utilities manager.

An informal group organized another University-wide event for Earth Day 2004 to mark the signing of the Talloires Declaration with a public address and seminars for decision-makers by sustainability pioneer, David Orr. This event, titled “Education for Sustainability: Engaging the Polytechnic University,” featured speeches by the President, the new Dean of the College of Architecture and Environmental Design (who is a nationally recognized leader in the sustainability movement), and the Dean of Engineering (who announced the formation of a Center for Sustainability in Engineering to promote research, teaching and outreach).

¹⁰ President Warren J. Baker, Response to Academic Senate Resolution AS-598-03/TC, Resolution in Support of Signing the Talloires Declaration (Cal Poly: August 21, 2003).

In his welcome to the Earth Day event, President Baker promulgated the University's commitment:

Cal Poly finds it fitting and appropriate to associate itself with the Talloires Declaration. As a polytechnic university, it is at the core of our mission to examine the ways in which knowledge may be applied to improve society, manage scarce resources and preserve the precious environmental values that support us physically as a species and uplift us spiritually. ...

In the implementation of the Master Plan, we are striving to strike a balance among several values and principles that we believe are all essential elements of a comprehensive vision of sustainability – including academic excellence, social justice, economic growth and efficiency and environmental protection. ...

By signing the Talloires Declaration, and associating the University formally with the declaration's sustainability principles, we wish to communicate Cal Poly's commitment to play a strong and positive role in applying sustainability principles locally, in our education, research and in the further development of our campus.¹¹

One direct consequence of the Talloires Signing event is the dedication of the Winter 2005 issue of the journal of the College of Liberal Arts, *Moebius*, to the subject of sustainability. The issue is prefaced with the text of the Declaration, and several of the articles written by students, faculty, staff and guests, will refer to it.

FOLLOWING THROUGH: CURRENT AND FUTURE LEADERSHIP

Cal Poly has an opportunity to implement many sustainability principles in facilities planned for the next few years. Faculty, students, staff and members of the San Luis Obispo community encouraged Cal Poly to pursue sustainable design during a series of workshops about the Poly Canyon Village project, which will house nearly 2,700 students on campus. In response, the campus retained a consulting team to suggest additional, visible sustainability features that will improve the project. As student housing, this project is self-funded based on anticipated revenues. Thus, it can incorporate capital investments to achieve sustainability standards so long as they are balanced by immediate savings in operating costs to avoid raising rents above the local market. The contractor selected for the project has bid to provide a LEED certified project.

[PLACE FIGURE 5 ABOUT HERE.]

The University is planning to incorporate sustainability practices in five other pending projects and has engaged mobility planning consultants to assist us with our goal of decreasing dependence on the automobile.

¹¹ President Warren J. Baker, Education for Sustainability: Engaging the Polytechnic University (Cal Poly: April 23, 2004).

Greening Cal Poly's academic curriculum proceeds in fits and starts, with faculty groups meeting informally to share ideas. Faculty in the College of Architecture and Environmental Design are active in proselytizing and innovative in developing cross disciplinary courses dedicated to sustainability. Projects in these classes often focus on ways that planning and operations at the University could embody sustainability principles, for instance with water reuse, alternative energy, roof gardens and mixed use housing. The College of Science and Mathematics sponsors an interdisciplinary environmental studies minor. The College of Engineering's new commitment emphasizes dealing with environmental costs and consequences of design in all courses rather than adding new classes. Agriculture stresses sustainability in forestry classes, horticulture courses dealing with selection of native or climate-appropriate plantings, and integrated pest management. Animal science faculty teach and manage land with sustainable grazing practices. An economist in Agribusiness works tirelessly as the advisor for the Sustainable Agriculture Resource Consortium. In the College of Business, two faculty members have participated for years in multi-disciplinary sustainability activities, but have had less success in incorporating principles of "Natural Capitalism" into their programs.

DEBRIEFING: THE CULTURAL CONTRAST CONTINUES

One of the challenges facing Cal Poly is how to organize in support of sustainable practices and the provisions of the Talloires Declaration. As noted earlier, a student body president established the Campus Sustainability Initiative (CSI), which involved faculty, staff and administrators as well, but atrophied with changing student leadership. Instead, follow-up has reverted to the different university cultures. The campus Sustainability Advisory Committee with faculty, administrators and students appointed by the President is advisory to the Vice President of Administration and Finance. This committee reviews measures dealing with natural resource utilization, land use and physical projects, expanding on its earlier charge to address energy use and recycling on campus. At the same time, the Academic Senate has established a new Standing Sustainability Committee, including faculty, administrators and students (some of whom are the same as on the Sustainability Advisory Committee). The charge to this committee includes "informing and supporting other committees whose scope encompasses environmental responsibility ... [and] ... making recommendations ... regarding the provisions of the Talloires Declaration."¹² Thus, we continue to see the environmental awareness apex of higher education sustainability triangle inspiring academic initiatives directly through the Academic Senate Standing Sustainability Committee and influencing facilities and operations directly through the administrative Sustainability Advisory Committee as well as indirectly through the Academic Senate Standing Sustainability Committee.

At our polytechnic campus, faculty with expertise in planning, design, engineering and construction have been instrumental in raising students' awareness about environmental issues and offering advice regarding sustainable practices. However, given faculty responsibility to their teaching and research activities, particularly the demands of the academic calendar, we have only been able to capitalize on their expertise in limited

¹² Cal Poly Academic Senate Resolution AS-622-04 (adopted October 26, 2004).

ways. Thus, one of the opportunities for leadership that lies ahead is in engaging this significant academic resource more directly to serve the planning and operational needs of the University.

From the faculty perspective: I believe that there is more sympathy for sustainability among all the constituencies of the University than has yet been realized. But there are few people for whom this cause is a full-time professional mandate. And fewer still who have influence where instructional, administrative and operational activities can overlap. One example: the Cal Poly Farm produces food on a large scale all year round: dairy products, meat, vegetables, fruit, and eggs. The University food service produces meals. What would it take to bring them together? The College of Business teaches accounting. What would it take for them to audit the costs of paper use in an institution that is completely wired and educated in electronic communication? To even entertain such questions would require academics to consider their own surroundings and actions as suitable objects for study and would require people who feel responsible for paying the bills to think of taking risks that could rattle the smooth operation of what appears to be a well oiled machine. For continuing and cumulative progress toward the goals of the Talloires Declaration to take place, leadership, commitment and incentives are needed at the highest levels of governance to encourage collaborative experimentation and pooling of energies among the educational and operational divisions of the University.

Steven Marx, Professor of English

From the student perspective: Students are a necessary catalyst in the paradigm shift of a university towards a culture of sustainability. Our fresh perspectives bring countless new insights into how to improve an age old institution. Our energy, enthusiasm, and hope encourage the administration and staff to realize the sustainable alternatives that are available. Sustainability in the University is integral to a holistic educational atmosphere. Institutions must practice and teach the wisdom of sustainability to fully prepare tomorrow's leaders for the challenges they face. By creating a living and learning culture of sustainability, the University not only educates, but is able to be both a laboratory for and an example of the myriad ways that environmental responsibility can be incorporated into the process of lifelong learning. Students are the primary agents of change in a university setting, the struggle is always to have a student voice present at the decision making table.

Tylor P. Middlestadt, ASI President

From the administrative perspective: The struggle between getting the project built and level of sustainability will continue to be at the center of most debates because the definition of a sustainable project differs from one person to another. The question of how much sustainability is enough often competes with the programmatic needs of users and budgetary constraints. One focus for implementation will be to make sure that we are improving our sustainability effort with each project. The sustainable practices used in projects to be built at Cal Poly over the next few years will establish a baseline for the future. In addition, we must continually look to other campuses, especially in California, as models for new directions we might take in incorporating sustainable practices. The other main focus is keeping communications open between administration, faculty, staff

and students. The exchange of information and ideas among all groups is critical to keeping Cal Poly environmentally responsible.

Robert Kitamura, Director, Facilities Planning and Capital Projects

From the planning perspective: I think that the biggest challenges facing Cal Poly's ability to implement more sustainable practices involve change management. The University has espoused noble principles in the Master Plan and made a public commitment through signing the Talloires Declaration. At the same time, Cal Poly has established a reputation for academic excellence and student quality that are unparalleled in the California State University system. This is recognized in the annual U.S. News and World Report rankings. While Cal Poly sees itself as a model for higher education, the institution also has a long history to protect. Thus, change is incremental on all fronts (student behavior, curriculum development, administrative operations). I see a constructive, dynamic balance not only in the form of the sustainability triangle, but also in cultural relationships. We need the activism of faculty and the enthusiasm of students to urge the campus forward toward its educational aspirations, but we also need the fiscal stewardship that is the responsibility of the administration. If we keep headed in the direction envisioned in our Master Plan, we can build toward a more sustainable future.

Linda Dalton, Executive Vice Provost and Chief Planning Officer

BIOGRAPHICAL NOTES:

Dalton holds a Ph.D. as well as professional certification in city planning and taught full-time before becoming Executive Vice Provost and Chief Planning Officer. Kitamura, AIA, practiced as an architect and developer in Southern and Central California before becoming Director of Facilities Planning and Capital Projects. Dalton and Kitamura coordinated the recent campus master plan revision. Marx is a Professor of English who established the Cal Poly Land project and promoted guest speakers to stimulate interest in sustainability. Middlestadt is an Architectural Engineering major who helped organize student interest in making Poly Canyon Village more sustainable and now serves as president of Cal Poly's Associated Students, Incorporated.

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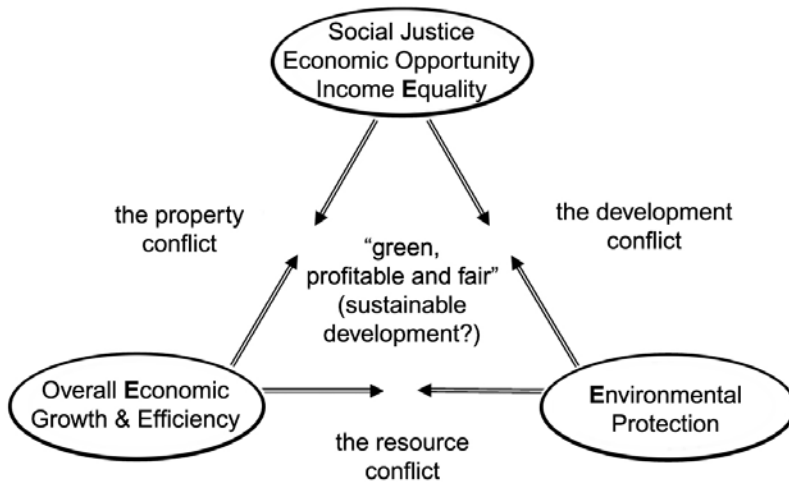


Figure 1. Sustainable Development Triangle from Campbell (1996)



Figure 2. Traditional University Relationships - Stable Two Apex Model with Distinct Cultures

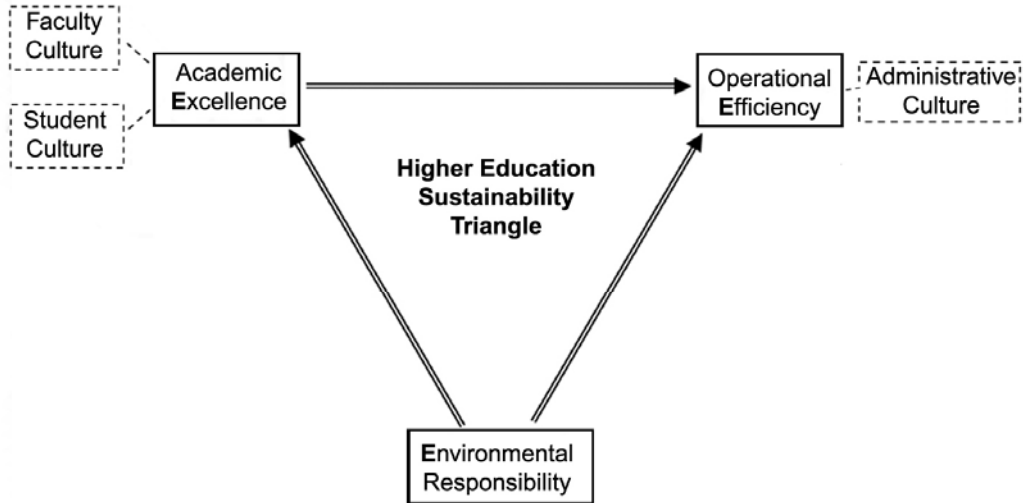


Figure 3. Emerging University Relationships - Dynamic Three Apex Model with Distinct Cultures

Figure 4. View of Cal Poly campus showing core and some environmentally sensitive surroundings (middle ground). Photo credit: Sky Bergman. [not included]

Figure 5. Poly Canyon Village workshop on sustainable practices. Photo credit: Joel Neel. [not included]