Scholarships of Discovery, Application, and Integration

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For questions regarding the WASC Self Study contact the WASC Coordinating Office.

Statement of Questions Addressed

The paradigm of the university as a *center of learning* for all members of the academic community necessarily includes faculty scholarship as an essential element. Scholarship often termed "professional development," is the process by which faculty engage in life-long learning and remain at the forefront of their disciplines. It is also the process by which new knowledge is discovered, applied or integrated. Cal Poly recognizes scholarly activity as a central part of its mission:

As a predominantly undergraduate, comprehensive, polytechnic university serving California, the mission of Cal Poly is to discover, integrate, articulate, and apply knowledge. This it does by emphasizing teaching; engaging in research; participating in the various communities, local, state, national, and international, with which it pursues common interests; and where appropriate, providing students with the unique experience of direct involvement with the actual challenges of their disciplines in the United States and abroad.

In its Strategic Plan, Cal Poly also recognizes and endorses, as part of the expectations for faculty, the four types of scholarship identified in the Carnegie Foundation report entitled *Scholarship Reconsidered: Priorities of the Professorate* (The Carnegie Foundation for the Advancement of Teaching, Princeton University Press, 1990). These are the Scholarships of Teaching, Discovery, Integration, and Application. Equally significant is our recognition of the role such scholarship plays in creating and enhancing an environment that fosters student learning.

Recently, the significance of student involvement in experiential learning and the methods and processes of inquiry have been reaffirmed by various national groups. The National Science Foundation in 1996 issued *Shaping the Future: New Expectations for Undergraduate Education in Science, Mathematics, Engineering and Technology*. The Kellogg Commission on the Future of State and Land Grant Universities in 1997 published *Returning to Our Roots: The Student Experience*, Kellogg Commission on the Future of State and Land-Grant Universities. The Council on Undergraduate Research in May 1999 made public its report of Testimony to House Science Committee, April 1998.

Two major assessment and planning initiatives have made similar affirmations within the CSU. The system-wide Academic Senate has emphasized the need for graduates to be "skilled in using various methods of inquiry: scientific, philosophical, problem-solving and artistic" and to be "able to analyze and evaluate both quantitative and qualitative data" and to recognize "the limits of empiricism" (Baccalaureate Education in the California State University November 1997). In its Cornerstones Report of December 1997, the CSU expressed "a commitment to encourage student involvement in scholarship, research and creative activity under faculty guidance, because these activities are central to the teaching mission of a comprehensive university." Similarly, in Cal Poly's own planning documents, the involvement of students in hands-on research and creative activities and the importance

of developing analytical, critical thinking and evaluative skills, is a recurring theme Visionary Pragmatism and University Strategic Plan college and unit strategic plans). Thus, Cal Poly views faculty scholarship to be inextricably intertwined with educational program quality and student learning and to be a vital component of the intellectual environment of the University.

The following general questions were posed to evaluate faculty scholarship:

1. To what extent do Cal Poly faculty engage in the scholarships of discovery, application and integration (Scholarship Reconsidered: Priorities of the Professorate), thus continuing to learn in their fields and to contribute to the learning of society?

2. What additional actions are appropriate to helping increase both qualitatively and quantitatively the University's scholarly achievements?

Before attempting to develop approaches to answering these questions, a working definition of faculty scholarship, intended to encompass the broad range of scholarly activities of faculty at comprehensive universities, was adopted:

> *Scholarship is defined as contributions to a field of learning that are recognized by peers as advancing the field, be it through the discovery, application, integration or dissemination of knowledge, or through the creation, performance or interpretation of artistic, musical or literary works.*

It should be noted that faculty accomplishments and contributions to their fields that occur *outside* the university, through private consulting arrangements, were not included in the analysis undertaken for this report.

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Methodology

Faculty scholarship was addressed in three ways, by:

- Quantifying and describing faculty scholarship.
- Assessing current policies and programs that either support or hinder faculty scholarship.
- Quantifying and describing the benefits to students of faculty scholarship.

Specific questions were articulated for each of these approaches and are listed below.

Quantifying and describing faculty scholarship:

1. What types of scholarship are engaged in by Cal Poly faculty?
2. What percentage of faculty engages in scholarship?
3. How much external funding is obtained in support of scholarship? How does it compare with other CSU campuses and/or similar comprehensive universities?
4. How many faculty receive professional awards or recognition from external entities (e.g. awards from professional societies; service on editorial boards of journals; service as reviewers of grant proposals or journal manuscripts; election to professional societies/organizations and service as officers in such societies/organizations)?
5. How extensively do faculty publish in peer-refereed journals? In other professional publications?
6. What creative contributions other than scholarly publications do faculty make in their disciplines (e.g. artistic and literary works, inventions)?
7. Assessing current policies and programs that either support or hinder faculty scholarship:
8. What formal university/college programs exist to support faculty scholarship?
9. What, if any, does the university do with organizations such as federal and state agencies to encourage support of faculty scholarship at Cal Poly?
10. To what extent are facilities, equipment and other physical resources adequate to support faculty scholarship? What specialized/unique resources are available?

11. Are library resources appropriate and sufficient to support faculty scholarship?
12. What conditions or factors prevent optimization of the level and quality of faculty scholarship at Cal Poly?
13. To what extent do policies permit/promote scholarship?

Quantifying and describing the benefits to students of faculty scholarship:
1. To what extent do teaching and scholarship merge?
2. To what extent are students involved in faculty scholarship?
3. What opportunities exist for student research experience off-campus?
4. What impact do student research experiences have on career choices/employment?

A variety of information sources were utilized to answer these questions. Table 1. correlates each question with the data sources used to address it.

Table 1. SOURCES USED TO OBTAIN DATA ON FACULTY SCHOLARSHIP

QUESTIONS ASKED	SOURCE
What types of scholarship are practiced by Cal Poly faculty?	C,D,E
What percentage of faculty engages in scholarship?	C,E
How much external funding is obtained in support of scholarship? How does this compare with other CSU campuses and/or similar comprehensive universities?	E
How many faculty receive professional awards or recognition from external entities?	A,C,N
How extensively do faculty publish in peer-reviewed journals? In other professional publications?	C,D
What creative contributions other than scholarly publications do faculty make in their disciplines (e.g. artistic and literary works, inventions)?	C,S
What formal university/college programs exist to support faculty scholarship?	D,G,R
What "lobbying," if any, does the University do with organizations such as federal and state agencies to encourage support of faculty scholarship at Cal Poly?	D
To what extent are facilities, equipment, and other physical resources adequate to support faculty scholarship? What specialized/unique resources are available?	D,E,J,K
Are library resources appropriate and sufficient to support faculty scholarship?	O
What conditions or factors prevent optimization of the level and quality of faculty scholarship at Cal Poly?	F,P
To what extent do policies permit/promote scholarship?	G,H
To what extent do teaching and scholarship merge?	I,D
To what extent are students involved in faculty scholarship?	I,Q
What opportunities exist for student research experience off-campus?	R

SOURCES USED:

A.	Accreditation reports
B.	College strategic plans
C.	Academic Senate program reviews
D.	Departmental information
E.	Grants Development Office database and Information
F.	Academic Senate Research & Professional Development Committee Survey
G.	Retention, Promotion and Tenure information
H.	Campus Administrative Manual and other CSU and Cal Poly policies
I.	Senior projects and theses
J.	Foundation/Sponsored Programs information
K.	Foundation and University Facilities departments
L.	Benchmarking information
M.	Other (specified)
N.	Cal Poly "Credit Report"
O.	Library Survey 1998 and Task Force Report on Library Collections 1998
P.	Cal Poly Strategic Plan and Academic Senate resolutions
Q.	Data from RGP Office
R.	Graduate Status Report and Career Services
S.	State Faculty Support Grant program

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Findings, Interpretations, and Analysis

Quantifying and Describing Faculty Scholarship

Q. 1. *What types of scholarship are practiced at Cal Poly?*

Creative and scholarly activities of Cal Poly faculty fall into the following categories:

- design, conduct, and publication of original research and research-related projects;
- artistic and musical design, performance and display;
- creation, publication and reading of literary works;
- design, construction, discovery and communication of new physical/chemical/biological/agricultural/engineering materials, processes, products or theories; physical structures and equipment; economic models and marketing plans;
- design, creation and implementation of new forms of teaching/learning in support of pedagogy.

Some of these scholarly activities are summarized and discussed elsewhere in this report. Examples of creation and scholarship that fall in the artistic and literary works categories are described in further detail below.

The scholarly and creative activities of Cal Poly faculty range from individual efforts to large, multi-million dollar projects that involve many faculty and students. In professional programs such as engineering, agriculture, architecture and business, applied research is emphasized. Specialized centers and institutes, involving groups of faculty, have evolved around specific research themes.. Nevertheless, interdisciplinary programs and collaborations among faculty in scholarly pursuits, particularly those that require cooperation across colleges, continue to be rare. (Additional information on special labs and projects)

Q. 2. *What percentage of faculty engages in scholarship?*

Each college in its *Faculty Personnel Policy Statements* includes remarks to encourage creative and scholarly activities in support of promotion and tenure under subheadings such as "professional growth and

development," "professional development and achievement," "research" and "creative scholarly achievements."

Program reviews, carried out by the Academic Senate on a five-year cycle, document the extent of scholarly activity of the faculty in each program. As discussed below, because of non-uniform reporting, it is difficult to quantify many of the measures of scholarly activity using these reviews. In addition, while all departments purport to require professional development activities for retention, tenure, and promotion, the definition of professional development varies among departments.

Based on the information available to this subcommittee, we concluded that a significant majority of Cal Poly faculty engage in some type of scholarship or creative activity. Participation in externally funded projects in support of scholarship, however, is much lower. In 1993-94 11.8 % of faculty were awarded grants or contracts. This percentage decreased each subsequent year and in 1997-98 it was only 7.9 %.

Q. 3. How much external funding is obtained in support of scholarship? How does this compare with other CSU campuses and/or similar comprehensive universities?

Table 2 provides quantitative information on the amount of external funding in support of faculty scholarship at Cal Poly, 12 other CSU campuses, and one comprehensive university outside California (Northern Arizona University).

Table 2. Award Information on Externally Sponsored Grants and Contracts at Cal Poly and Twelve Other CSU Campuses, and a Comparable Non-CSU Institution												
		93-94				94-95				95-96		
Institution	#	Dollars (millions)	FTE	$ / FTE (Thousands)	#	Dollars (millions)	FTE	$ / FTE (Thousands)	#	Dollars (millions)	FTE	$ / FTE (Thousands)
San Diego	628	$ 67.3	1019	$ 66.0	638	$ 65.9	1052	$ 62.6	594	$ 73.6	1072	$ 68.7
Sacramento	445	$ 23.7	819	$ 28.9	537	$ 29.1	827	$ 35.2	551	$ 34.2	828	$ 41.3
Chico	218	$ 14.8	592	$ 25.1	259	$ 20.2	602	$ 33.5	250	$ 19.8	609	$ 32.5
Sonoma	60	$ 6.8	269	$ 25.2	84	$ 5.9	247	$ 23.9	96	$ 8.8	267	$ 33.0
San Jose	340	$ 26.5	997	$ 26.5	387	$ 28.6	1003	$ 28.6	328	$ 25.9	988	$ 26.2
Northern Arizona University	277	$ 18.3	543	$ 33.7	293	$ 20.5	572	$ 35.8	327	$ 20.9	628	$ 33.3
LA	114	$ 13.8	586	$ 23.5	137	$ 16.9	578	$ 29.3	131	$ 14.3	617	$ 23.2
San Bernardino	74	$ 7.3	445	$ 16.5	74	$ 7.8	458	$ 16.9	83	$ 6.4	464	$ 13.7
Fresno	198	$ 11.2	717	$ 15.6	230	$ 12.3	722	$ 17.0	227	$ 13.9	715	$ 19.4
Humboldt	151	$ 5.6	350	$ 16.0	188	$ 7.5	372	$ 20.2	165	$ 6.7	378	$ 17.7
Hayward	54	$ 3.2	420	$ 7.6	54	$ 4.4	445	$ 9.9	65	$ 4.5	463	$ 9.7
San Luis Obispo	169	$ 8.9	697	$ 12.8	123	$ 8.0	699	$ 11.4	114	$ 7.7	713	$ 10.8
Northridge	111	$ 8.9	891	$ 10.0	112	$ 8.7	903	$ 9.7	98	$ 8.6	896	$ 9.5
Pomona	50	$ 4.1	665	$ 6.2	63	$ 4.1	664	$ 6.2	42	$ 5.7	680	$ 8.4

	96-97	97-98

Institution	#	Dollars (millions)	FTE	$ / FTE (Thousands)	#	Dollars (millions)	FTE	$ / FTE (Thousands)
San Diego	621	$ 85.0	1123	$ 75.7	733	$ 92.6	1150	$ 80.5
Sacramento	546	$ 29.7	845	$ 35.2	526	$ 34.4	868	$ 39.6
Chico	245	$ 24.8	613	$ 40.5	252	$ 23.7	628	$ 37.7
Sonoma	103	$ 7.4	278	$ 26.6	78	$ 9.7	287	$ 33.6
San Jose	353	$ 28.9	991	$ 29.1	337	$ 32.2	990	$ 32.6
Northern Arizona University	320	$ 19.6	731	$ 26.9	334	$ 20.6	751	$ 27.4
LA	147	$ 13.0	629	$ 20.6	111	$ 13.1	647	$ 20.2
San Bernardino	86	$ 5.3	472	$ 11.2	100	$ 8.6	473	$ 18.2
Fresno	200	$ 12.0	726	$ 16.5	194	$ 13.2	746	$ 17.6
Humboldt	155	$ 5.9	399	$ 14.8	174	$ 6.5	402	$ 16.2
Hayward	78	$ 3.8	460	$ 8.3	86	$ 5.8	473	$ 12.3
San Luis Obispo	104	$ 6.7	743	$ 9.0	96	$ 8.5	769	$ 11.1
Northridge	94	$ 6.3	904	$ 7.0	132	$ 9.7	928	$ 10.5
Pomona	75	$ 7.2	689	$ 10.5	70	$ 6.6	690	$ 9.6

Data are provided for a five-year period, from 1993-94 through 1997-98. The data report the amount of external funding obtained for grants and contracts carried out by university faculty and staff. The overwhelming majority of these grants and contracts support faculty scholarship. Some, however, support student activities and training programs, so the data provide only an index, not an actual accounting, of support specifically for faculty scholarship. This table includes only grant and contract funding managed by the Cal Poly Foundation. A small amount of grant funding is received directly by the university. The same is likely to be true for most of the other campuses listed in the Table and would not significantly affect rankings.

Cal Poly ranked tenth among the fourteen campuses that responded to our survey in the amount of grant and contract funding in '97-'98, and twelfth in funding per full-time equivalent faculty (FTEF), which adjusts for the different sizes of the reporting campuses. With the exception of San Diego State and CSU--Chico, the annual award amounts have not shown a significant increase from '93-'94. Rather, award amounts tended to fluctuate from year to year. Annual expenditures on grants and contracts at Cal Poly did increase steadily each of these years, from $5.9 million in 1993-94 to $7.5 million in 1997-98. The corresponding figure for 1998-99 is estimated to be $9.8 million. Expenditure data are a more accurate reflection of actual grant and contract activity since they do not include multi-year awards, as do the annual award totals.

Given Cal Poly's excellent academic reputation both within and outside the CSU, and the outstanding qualifications of our faculty, there appears to be much room for growth in the amount of external funding the faculty secure to support their work. Cal Poly should rank much higher among its sister institutions, particularly since the professional programs that make up the majority of our academic offerings have greater availability of funding than do non-professional programs. Particularly troubling is the decline each year in the number of awards to Cal Poly faculty, from 169 in '93-'94 to only 96 in '97-'98. This is directly correlated with the number of proposals submitted (284 in '93-'94 and 207 in '97-98) and reflects a lower percentage of faculty both applying for and receiving grant and contract awards. Additional information on

external support for faculty scholarship is available at Grants Development Office.

Finally, it should be noted that restricted gifts are a source of some funding to support faculty scholarship received by the university through the Division of University Advancement. These were not quantified for the report but are thought to be insignificant when compared to the funding acquired through grants and contracts.

Q. 4. How many faculty receive professional awards or recognition from external entities (for example, awards from professional societies; service on editorial boards of journals; service as reviewers of grant proposals or journal manuscripts; election to professional societies/organizations and service as officers of such societies/organizations)?

It is difficult to provide a specific numeric answer to this question because the university does not maintain a formal database that tabulates the occurrences of faculty awards. However, specific information on some aspects of this type of faculty activity are reported in non-uniform formats by each department for the periodic program review conducted by the university at least every five years. In addition to this, we have accreditation reports, prepared for external professional boards, for all programs that can be accredited. Noteworthy faculty accomplishments are also reported in university news reports published by the University Communications Office.

It is difficult to simplify the diverse range of documented evidence of faculty awards and recognition into a single summary table for this report. However, we can confirm that there is ample evidence to sustain the claim that Cal Poly faculty do seem to receive such awards in each of the subcategories identified in the question. Verification of this can be found in the *Program Review* reports available centrally from the Vice Provost for Academic Affairs or the *Credit Reports* (or *Cal Poly Reports* prior to 1994), which are archived by the University Communications Office. The latter, however, probably underestimate the extent of recognition since the information is self-reported.

A representative university-wide sample of the summary tables from seven different program reviews (one from each of the six colleges and the University Center for Teacher Education), and a copy of the *Credit Report*, are included in Appendix I.3.A as a factual supplement in support of the above narrative.

Q. 5. How extensively do faculty publish in peer-reviewed journals? In other professional publications?

Table 3 provides summary data on the number of publications and full-time equivalent faculty (FTEF) derived mainly from the Program Review documents of the Academic Senate.

Table 3. Faculty Publications as Reported in Five-Year Program Review Documents. See text for explanation.

COLLEGE	DEPARTMENT	FTEF	YEAR REVIEWED	TOTAL PUBLICATIONS	PEER-REVIEWED
Agriculture	Rec. Admin.	2	96-7	29	NR
	Agribusiness	18	95-6	5	NR
	Animal Science	11	95-6	10	8
	Forestry/NRM	8	94-5	14	NR
	Ag. Eng.	12	93-4	113	18
	Soil Science	7	97-8	48	35
	Orn. Hort.	9	93-4	3	NR
	Food Sci./Nutr.	15	97-8	53	NR
	Ag. Ed.	6	93-4	54	2
	Crop Science	12	96-7	67	18
	Dairy Science	9	98-9	146	64
	DPTC			NR	NR

Architecture	Landscape Arch. City/Reg. Plan. Arch. Arch. Eng.	18 10 39 10	93-4 96-7 96-7 94-5	42 16 22 NR	23 NR NR NR
Business	Bus. Admin. Econ. Ind. Tech.	40 9 10	97-8 96-7 93-4	284 27 7	NR 16 1
Engineering	Mech. Eng. Comp. Eng. Elec. Eng. Comp. Sci. Materials Eng.	25 14 29 33 7	94-5 97-8 96-7 95-6 95-6	58 16 38 35 40	NR NR NR 32 NR
Liberal Arts	History Modern Lang. Music Journalism Ethnic Studies Philosophy English Theat./Dance Psyc./H.D. Liberal Studies Speech Com. Social Science Graphic Com. Art /Design	15 6 10 12 5 14 33 5 25 2 13 17 35 14	95-6 94-5 94-5 93-4 97-8 97-8 96-7 94-5 97-8 93-4 96-7 96-7 97-8 93-4	15 27 14 1 NR 76 26 2 74 NR 22 42 30 6	NR NR NR NR NR 76 26 NR NR NR NR 42 NR 6
Science/Math	P.E.&K. Physics Chem./Biochem. Math Biology	14 30 25 45 26	93-4 97-8 97-8 94-5 95-6	22 86 37 31 188	12 86 '10 31 66
UCTE		14	93-4	18	6
TOTALS		713		1844	578

Each academic department undergoes such a review every five years. As a result, the data in the table indicate the activity in the five years prior to the review date. Where the program review document did not include information on FTEF, current data were obtained by phoning the department office. The data cited are from the most recent Academic Senate reviews of a particular department. No attempt was made to locate older records (if they exist) to develop a trend for each department. The reports are not uniform and the majority of departments did not differentiate between articles that were peer-reviewed and those that were not. Although the Academic Senate records portray the Cal Poly faculty as active professional writers, they do not allow an accurate assessment of types of publications. The data show a total of 1,844 publications out of which 578 are identified as peer-reviewed; the number of peer-reviewed publications may, in fact, be somewhat greater.

Q. 6. *What creative contributions other than scholarly publications do faculty make in their disciplines?*

In addition to traditional research and scholarly publications, creative contributions of Cal Poly faculty run the gamut of activities described under Question 1, above. Artistic and musical contributions are many, and

include development of artistic works for exhibitions, competitions, commissions, corporate clients, and consignments. Examples include design of poster and T-shirts for Mardi Gras; development of product labels for Sea and Ski ™; sculptures for the lobby of the Cal Poly Theater; local, national and international exhibits of original artistic works in a variety of media, including photography; concerts and recitals by music faculty locally, statewide, nationally and internationally, often of original compositions; and composition and production of theater and dance. Literary works include writing and reading of original work (essays, short stories, novels, poetry) locally, regionally, nationally and internationally. Other examples are print and broadcast journalism (radio and television); computer animation and graphics; and architectural and landscape design. Funding sources encompass private, public and internal support (small seed grants funded through the State Faculty Support Grant Program, and other University programs).

Assessing current policies and programs that either support or hinder faculty scholarship.

Several questions were posed to assess the ways in which infrastructure and policies (formal and informal) affect faculty scholarship. Infrastructure includes library resources and collections; research facilities and equipment; and other physical resources. Policies include official CSU and Cal Poly policies published in the Campus Administrative Manual (CAM), UCAM and other authorized sources; university and college policies/programs that support research, including intervention with state and federal agencies in support of faculty scholarship; and any other Cal Poly/CSU policies or factors that affect optimization of the level and quality of faculty scholarship.

Q. 7. *What formal university/college programs exist to support faculty scholarship?*

Several university-wide and college-based programs exist to support faculty scholarship. A survey of the six colleges of the university and the University Center for Teacher Education (UCTE) revealed that all provide some sort of direct support for faculty scholarship or for grant proposal writing by faculty, although the mechanisms and amounts vary. The College of Business, for example, has a formal program that is used to evaluate faculty scholarship annually, and released time to support that scholarship is awarded accordingly. Similarly, the College of Liberal Arts has instituted a new program whereby 36 Weighted Teaching Units (WTUs) of released time are awarded annually to faculty to support their scholarly activities. Awards are made on a competitive basis. The College of Science and Math has a college "development" committee that allocates released time specifically for grant proposal writing. Likewise, the College of Agriculture allots $10,000 each year for this purpose (approximately 10 WTUs). Several colleges and the UCTE noted that they provide support for the scholarly activities of new faculty in the form of a reduced teaching load in their first year of appointment. Travel support for faculty to participate in professional meetings is also available through the colleges and UCTE.

Matching funds for equipment and release time are also provided for faculty with grants. These matching funds are made available as part of a cooperative agreement between the colleges and the Provost's Office, to encourage faculty to seek competitive federal funding. On such grants, the university will provide any matching funds required by the agency, usually on equipment, and will match any released time funded on the grant. The match is divided among the Provost's Office (50%), the College Dean's Office (25%) and the faculty member's department (25%). In 1998-99 a total of ~$200,000 was allocated through this program.

Internal funding is also available to help faculty initiate or redirect their scholarly activities, through programs administered at the university level. These are listed on Page 4 of Appendix I.3.B and include State Faculty Support Grants (through the Chancellor's Office), University Services Summer Awards and Professional Development Grants (through Human Resources), and Assigned Time for Proposal Development (through Research and Graduate Programs). Approximately $300,000 is available annually through these programs. Faculty may access funding opportunities at the CSU system-level through the University Services and Faculty Fellows Programs, which recruit faculty to work as consultants for special projects of state agencies and the state legislature.

Considerable resources are available to assist faculty in securing grant and contract support for their scholarly efforts. The Grants Development Office provides pre-award support, assisting in identification and

dissemination of funding opportunities (facilitated by InfoEd's Sponsored Programs Information Network, a leading commercial database), and preparation and submission of proposals. Workshops are held at least quarterly, and by special arrangement, to train faculty to use the database and educate them on funding opportunities in their disciplines. The Cal Poly Foundation provides post-award support once grants/contracts are awarded.

Q. 8. What lobbying, if any, does the University do with organizations such as federal and state agencies, to encourage support of faculty scholarship at Cal Poly?

Unlike other universities, Cal Poly has no formal lobbying program. The Office of Government and Community Relations, within the University Advancement Division, is responsible for tracking legislation at the federal and state level that affects the university, and working with local representatives to both the state and federal legislatures to promote Cal Poly's programs. It also does extensive networking with local government and businesses, which has resulted in professional development opportunities for faculty. The Deans of the Colleges, Director of the UCTE, and the Dean for Research and Graduate Programs, as well as the President of the University, have served on national advisory boards and developed close relationships in specific federal agencies, on an individual basis. Cal Poly belongs to NASULGC (National Association of State Universities and Land Grant Universities) and has representatives on its various councils. NASULGC lobbies for its constituents at the federal level and strongly promotes university research.

Q. 9. To what extent are facilities, equipment and other physical resources adequate to support faculty scholarship? What specialized/unique resources are available?

As a result of funding by external sponsors, research-related equipment purchased for use on specific sponsored projects is available for use by faculty and becomes the property of the University after the termination of the projects. Two databases are available for locating such equipment - the Cal Poly Foundation's fixed assets database and the university's property management database.

The Foundation maintains a fixed asset database of all equipment purchased on active and recently terminated sponsored projects. Data contained in the Foundation database include a description of the item, vendor, serial number, project number, location, as well as other fields used to track the item. Every year, the Foundation transfers items from the database to the university. The Foundation database is searchable by means of a request to the Foundation Business Office. However, data are not categorized in a fashion that would make the database easy for faculty to utilize to find research-related equipment.

The university maintains a property management database of all equipment owned by the university. Equipment is coded per an Equipment Code Conversion Table (as required by the State Administrative Manual). The university currently identifies items transferred from the Foundation with a special code to facilitate tracking. The database is searchable based on the special Foundation code or based on the equipment codes required by SAM. However, as with the Foundation database, a special request for a search must be made to University Fiscal Services to search for an item. The data categories may be somewhat more useful than the Foundation database for searching for a particular type of equipment.

An informal survey was done of research quality equipment on campus. Although too extensive to include, the type of survey that had to be done (department by department) confirmed that there is no central repository of equipment information, at any administrative level, that can be accessed to determine the existence and availability of particular equipment or instrumentation on campus.

Resources and special equipment and instrumentation on campus have been increased through the development of research centers and institutes at Cal Poly. Cooperative efforts among Cal Poly faculty have produced fifteen centers and institutes that promote scholarly activities and professional development. These centers and institutes have been active in obtaining significant grant and contract support and in bringing faculty together to pursue common interests. Often they also develop specialized laboratories and facilities, such as the biotechnology capabilities of the Environmental Biotechnology Institute; the computing capability of the CAD Research Center; the model irrigation practices field and water delivery facility of the Irrigation Training and Research Institute; the milk processing plant and cheese-making facility of the Dairy

Products Technology Center; and the specialized engineering research facilities of Applied Research and Development Facilities and Activities (ARDFA's) Advanced Technology Laboratories. The Advanced Technology Laboratories (ATL) are nearing completion and will provide space for interdisciplinary, undergraduate research, applied masters level research, and faculty research. The ATL was funded by a grant from the National Science Foundation with matching funds from industry.

Perhaps the most important physical limitation to faculty scholarship is space. As noted below, system-wide formulae that result in funding for physical facilities take into account only instructional space and set limits on the amount of non-instructional space. For this reason, some specialized research facilities are housed in structures that have been funded through direct and indirect cost income from grants and contracts and through private donations. Similarly, research equipment is often donated by industry. New faculty often have difficulty obtaining sufficient space to establish the laboratories needed to carry out their research.

Q. 10. Are Library resources appropriate and sufficient to support faculty scholarship?

The faculty recognize that library resources have dwindled in the last five years due to budget restrictions, as evidenced by their responses in the Library Survey done in the Spring of 1998. When asked how the library could be improved, the majority wanted more extensive and up-to-date book collections and more periodical subscriptions in their subject areas.

Cal Poly library statistics and a system-wide report on the CSU collections (CSU Task Force on Library Collections), confirm that fewer books have been purchased in the last five years and that the library has fewer periodical subscriptions in print format available locally. However, during this same time, the number of electronic databases has increased and the number of electronic journals either on-line or with full-text journals has increased. A glance at the Kennedy Library Web pages shows the many databases now available for research and the growing number of electronic journal systems to which we subscribe, such as IDEAL (Springer-Verlag journals) and J-Stor with full text availability of articles. The CSU Link project was also started and today provides a single database of books for seven campuses. These books can be requested on-line and they arrive at Cal Poly usually within three working days. The Interlibrary Loan system in the library has speeded operations by using FAX, UNCOVER, etc. and has the materials here in 3-5 days. The CSU system is developing a 22-campus library database that will further expand book access; they are also building an electronic core periodical database which will be available to each campus.

Judging from responses to the Library Survey, many faculty do not know about new electronic databases or the periodicals on-line. This is probably due to the fact that many of these systems come to us from the CSU through special buying arrangements. Therefore, they do not necessarily reflect the particular research materials requested by the Cal Poly faculty, but are items that are currently available and are wanted by a majority of the CSU libraries. The CSU recognizes that we also need more extensive and up-to-date book and periodical collections and was successful in getting $10 million to increase acquisition budgets; the Kennedy Library received $492,000 in one-time supplemental funding in1998/99.

Despite the current collection limitations, the faculty have been able to accomplish significant research with our library resources and now have access to many electronic databases and electronic journals. The UCSB Library is 90 miles away and is used by some faculty; others use research libraries in Los Angeles and the San Francisco area when needed. In recent years the library has conducted an outreach program to new faculty, inviting them to identify materials in their fields of scholarship that they would like the library to acquire. Up to $500 is made available to each new faculty member for this purpose.

Q. 11. What conditions or factors prevent optimization of the level and quality of faculty scholarship at Cal Poly?

In 1996, the Research and Professional Development Committee was formed by the Academic Senate (replacing another committee with similar responsibilities) and given the charge to assist in the development of research policies for the campus. In early 1997, the committee conducted a campus-wide survey to identify barriers to faculty scholarship and creative activities on campus. Eight barriers were identified by this survey:

❍ Unavailability of funds to maintain a professional development program for faculty;

❍ Lack of policy to provide for research/creative activity space allocation;

❍ Inequitable teaching loads;

❍ Inadequacy of "seed" funds to develop or expand creative/investigative activities;

❍ Insufficient support for graduate courses and programs;

❍ Lack of standardized RPT criteria that acknowledges research as a valued activity;

❍ Unavailability of functional, "supportive", intellectual environment;

❍ Ambiguous policy regarding intellectual property of inventors.

❍ The committee has prepared recommendations for creating an environment that supports faculty in their scholarly work, in the form of an Academic Senate resolution. This resolution was discussed extensively by the Senate and approved on May 25, 1999 (Appendix I.3.C: Academic Senate Resolution on Development of a Research and Professional Development Infrastructure at Cal Poly). An Intellectual Property Policy, with clear principles and guidelines, has been approved since the survey was conducted.

Q. 12. To what extent do policies permit/promote scholarship?

Cal Poly's commitment to faculty and staff professional development permeates campus policy and procedures established over the past ten to twenty years. As part of this self-study, an inventory was made of policy and procedural documents to assemble pertinent statements on professional development. The inventory (Appendix I.3.B: Inventory of CPSLO Policies and Programs that Support Faculty Professional Development and Scholarship) shows a forceful and consistent record of encouraging and supporting faculty development and scholarship. Such activities are clearly recognized as essential to maintaining excellence in undergraduate instruction, which is the primary mission of the university. The policies and procedures leave no doubt that faculty must demonstrate achievement in professional development and scholarship to succeed at Cal Poly, and many mechanisms exist to support these pursuits. In addition to sabbatical and leave policies, modest released time and grant programs are available. The record also clearly recognizes the limitations on certain on-campus development and scholarship activities due to system-wide formulas that dictate faculty teaching load and allocate space and equipment based predominantly on instructional needs.

Quantifying and describing the benefits to students of faculty scholarship.

Q.13 To what extent do teaching and scholarship merge?

The Academic Senate Resolution on Development of a Research and Professional Development Infrastructure at Cal Poly (Appendix I.3.C), approved in May 1999, listed the benefits to students of faculty involvement in research and scholarship. The following is an excerpt from that resolution.

"The benefits of faculty scholarship are many..."

❍ Scholarship enables faculty to maintain currency in their disciplines.

❍ Scholarship keeps teaching relevant and lively.

❍ Scholarship provides opportunities for undergraduates to engage in sustained work on demanding, multifaceted problems in which they learn to define and communicate their own solutions, and to develop critical thinking and analytical skills.

❍ Scholarship provides opportunities for students to acquire core competencies that are valued by employers.

❍ Scholarship provides for extended individual interaction between faculty and students."

In addition, individual examples abound of faculty using their scholarly interests to develop innovative courses and bring new technologies to the classroom and teaching laboratory. To cite one example, geographic information systems (GIS) technology was introduced to the campus by faculty who used the technology to pursue their professional interests. It is now an integral part of many curricula,

including landscape architecture, biological sciences and various agriculture programs. Faculty research interests have brought many techniques and specialized instruments to campus that are now integrated into the instructional programs.

Q. 14. *To what extent are students involved in faculty scholarship?*

As noted above, students participate in and benefit from faculty scholarship in various ways, in addition to the obvious enhancement of the quality of teaching when faculty are actively engaged in and up-to-date in their disciplines.

In 1996, 1997 and 1998, the Cal Poly Foundation employed 408, 429, and 432 students, respectively, on faculty grants and contracts (~ one student per $23,000 of funding). In 1996-97 and 1997-98 a total of 25 students were employed on faculty projects funded through the State Faculty Support Grant Program (~ one student per $6000 of funding). In addition to obtaining research experience, these students also received the financial benefits and the convenience of on-campus employment.
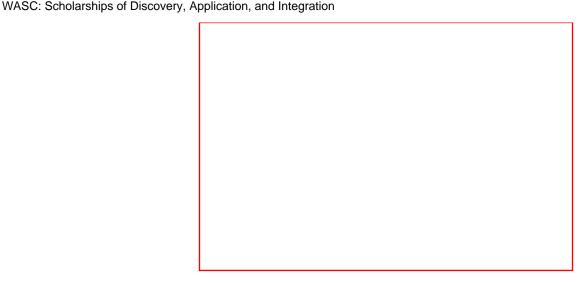
Participation of students in professional conferences and other research competitions and venues, is usually exclusively the result of involvement with faculty research. For example, students in the Psychology Department often co-author scholarly papers with faculty. Two or three students each year attend professional meetings with professors from this department and funding is available for these endeavors through alumni contributions and discretionary funds within the department. As another example, students and a professor from the University Center for Teacher Education made a joint presentation at the American Educational Research Association (AERA) 1998 Annual Conference. Four students described district models for administrator preparation that were designed in collaboration with the Cal Poly professor. Architecture faculty teaching senior-thesis-design-studio have incorporated student research paper writing and student presentations at professional conferences into the curriculum.

The Department of Psychology has made a research internship an option to replace a required two quarters of fieldwork. Highly motivated students are provided the opportunity to replace this fieldwork with an intensive research experience with a faculty member. The student works fifteen hours each week in research. Five to ten students per year take advantage of this option.

The Psychology and Human Development Department just completed its fifth annual research symposium. Students and faculty presented posters of their current research projects for other students and faculty to observe. Some of these projects are student-only; others are faculty-only; and about 1/3 are combined student-and-faculty. The Chemistry and Biochemistry, and Biological Sciences departments joined this year to co-sponsor a similar research symposium in the College of Science and Mathematics.

For the past five years Cal Poly students have entered a CSU student research competition. These research projects may be their individual theses or senior projects, or may be done in collaboration with faculty research. As Figure 1 indicates, the number of submissions has increased almost every year. Approximately 7-10 students from Cal Poly have been selected to go to the CSU statewide event each year, and on the average 2-3 Cal Poly students have winning submissions, a rate that is above average for the competing campuses. In 1997, a Cal Poly undergraduate student named Scott Peterson won first place in the competition in the undergraduate computer science and engineering division, for his senior project "Modeling Organic Shapes Using Soft Primitives." The project created a set of tools that enabled computer graphic artists "to create smooth organic shapes such as flowing water or billowing dust." Scott's project helped him obtain a position after graduation with PDI Productions, where he spent his first year working on animation for the movie ANTZ. Scott's work can be seen in the film in "crowds of ants, impacts of dust, torrents of water, and…the snow angel….on the powdered sugar donut."

Results of Student Research Competitions 1993-1998

Number of student entries, number of students selected to attend the CSU-wide event, and number of winners in the event

Senior projects across Cal Poly provide students with the opportunity to do projects alone or with faculty members. Many of these projects make important first steps or distinguished contributions to the scientific community each year. This tradition has been questioned recently because a significant number of students do not graduate because of failure to complete the senior project. However, the unique benefits of this model probably outweigh the costs. The senior project is a unique aspect of the Cal Poly experience.

Q. 15. What opportunities exist for student research experience off campus?

In 1996, 16 Master's theses involved work done at off-campus sites; the corresponding numbers for 1997 and 1998 were 25 and 12, respectively. The total theses approved in the same years were 78, 95 and 66. Thus, off-campus research accounts for a significant fraction of Master's thesis research. Table 4 lists the agencies, laboratories and organizations that hosted the students. They ranged from federal and state agencies to private foundations and businesses.

TABLE 4. OPPORTUNITIES FOR STUDENT RESEARCH EXPERIENCE OFF-CAMPUS (E.G., SPECIAL PROGRAMS, NATIONAL LABS, NASA, INDUSTRY PROJECTS, COMMUNITY PROJECTS, FOUNDATIONS, COMPANIES, STATE OR FEDERAL AGENCIES, ETC.) AS FOUND IN MASTER'S THESES AT CAL POLY.

1996

-Economic Development Administration/
 U.S. Department of Commerce
-Peace Corps/Philippines
-Philippines Department of Agriculture/
 Freshwater Fisheries Program
-Post Tensioning Institute
-BFL-OWEN
-The Nature Conservancy
-Environmental Resources Division @ VAFB
-CA Department of Fish and Game/
 Sea Otter Project
-National Biological Service
-U.S. Fish and Wildlife Service
-Argonne National Laboratory
-U.S. Navy Facilities Engineering
-Service Command
-National Science Foundation
-NASA (three projects)

1998

-CA Department of Parks and Recreation/
 SLO Coast District
-U.S. Forest Service (USFS)
-Central Coast Regional Water Quality Control Board
 (CCRWQCB)
-California Department of Forestry
-Natural Resources Conservation Service
-CA Department of Fish and Game/
 Monterey Salmon and Trout Project
-NASA (two projects)
-National Science Foundation (two projects)
-Basic Vegetable Products
-CONACYT

<u>1997</u>

-Dairy Management, Inc.
-Centre for Food and Animal Research/Canada
-CA Department of Forestry and Fire Protection/
-Urban & Community Forestry Program
-Land Conservancy
-San Luis Obispo County
-City of San Luis Obispo
-Engro West, Inc.
-Regional Water Quality Control Board
-Pacific Agricultural Research Corp.
-National Science Foundation (four projects)
-Allied Signal Automotive
-Lawrence Livermore National Laboratory
-AMDAFT Project
-U.S. Department of Defense
-Aurora Engineering
-Interlink Electronics
-The Orvis Company
-Lockheed-Martin
-NASA
-Ionation-Fremont
-Sierra Vista Regional Medical Center
-Twin Cities Community Hospital

There are other examples of off-campus fieldwork and research. Students in EDUC 518, "Educational Fieldwork", complete a minimum of 60 hours of work putting into practice the theory behind ten overarching competencies that assist them in developing the skills of school administration. Just a few examples of student scholarship in conducting fieldwork are as follows:

❍ Development and field-test of a rubric for use in assessment of new teachers

❍ Site development and implementation of a Safe School Plan based upon national and state research

❍ Review of research

In 1997, the NIH awarded Cal Poly a Minority International Research Training (MIRT) Grant by the NIH for biomedical research training of minority students. This NIH program funds minority students to do biomedical research in laboratories in foreign countries. The students work with either a Cal Poly faculty member at the foreign institution or with the local faculty at the foreign site. Approximately eight students and three faculty have participated in the program each year since 1997. Research sites include Cambridge, England; Mallorca, Spain; Prague, Czech Republic; Guatemala; and Peru. Students' areas of research are the biological and bio-behavioral sciences.

Many off-campus internship opportunities exist for students in professional programs. In 1998-99 750 students participated in co-ops and internships off campus. Information was not available as to how many of these internships involved research. It is likely that most do not, but instead provide relevant work experience.

Q. 16. *What impact do student research experiences have on career choices/employment?*

The subcommittee originally planned to survey Cal Poly alumni 5-10 years past graduation concerning their participation in research as students and the effects this may have has in their subsequent careers. It was determined, however, that there was no easily accessible database of information on graduates from the specified classes to permit the survey to be done. Some information is available and suggests that research has an important influence. The Career Services' Graduate Status Report cites an increase from 15% to 18% in graduate school enrollment between 1994 and 1998. Increased student participation in faculty research may have influenced higher enrollment in graduate programs. The undergraduate career counselors cite evidence that senior projects and "co-ops" lead to more and better employment opportunities.

Discussion, Recommendations, and Conclusions

The following general conclusions can be drawn from this analysis of faculty scholarship at Cal Poly:

- Scholarship is a valued and integral part of the university enterprise and informs hiring, retention, promotion and tenure policies.
- Particularly valued is the important role faculty scholarship plays in maintaining and enhancing the quality of the teaching-learning experience.
- Cal Poly faculty engage in scholarly activities that are typical of most universities, with an emphasis on applied research in the professional fields.
- Undergraduate and graduate students benefit directly and indirectly from faculty scholarship, and these opportunities are supplemented with off-campus research experiences.
- The level of faculty involvement in externally funded research and scholarly activity is low in comparison to other campuses in the CSU.
- Resources and support for faculty scholarship do not meet the needs and desires of faculty; nor are they consistent with the apparent degree to which scholarship is valued by the university community.
- The University does not have current procedures in place to track the kind of information that is needed to assess the research and scholarly activity of faculty and its impact on teaching and learning.

Several recommendations emerged from our analysis. **The principal recommendation is that the university provide more support for and recognition of faculty scholarship.** To this end, it is recommended that the President and Provost endorse and fully implement the Academic Senate Resolution on Development of a Research and Professional Development Infrastructure at Cal Poly. The specific recommendations contained in that resolution are as follows:

- That research and other scholarly activities be a factor in assigning faculty work loads.
- That research and other scholarly activities be a factor in assigning faculty workspace, facilities, and equipment, without compromising the quality of undergraduate education.
- That campus resource allocations include considerations of research and other scholarly activities, without compromising the quality of undergraduate education.
- That research programs and proposal development efforts be encouraged and supported.
- That scholarly activities be given consistent recognition in retention, tenure, and promotional decisions at all levels of review.
- That research opportunities be encouraged as a valuable component of undergraduate education.
- That graduate curricula be encouraged and developed, including funding for recruitment of graduate students and for graduate assistants.

The second general recommendation is **that the University support and encourage more involvement of students in faculty research and scholarship.** The subcommittee noted that in most universities, student involvement in faculty research is more common and extensive than it is at Cal Poly. The benefits of this involvement are reciprocal. Students benefit from the experience of direct inquiry, and the scholarship of the faculty is facilitated by student participation. Thus it would seem desirable to encourage students to work with faculty in their scholarly activities and to encourage faculty to involve students in these activities. Possible ways to encourage faculty to involve students in their work are:

- Provide institutional funds for faculty to hire students as research assistants.
- Expand existing programs to increase the opportunities for students to assist in faculty research.
- Expand graduate programs.
- Further explore joint doctoral programs with Ph.D. granting institutions.
- Develop an undergraduate honors program that provides incentives for students to conduct research with faculty.
- Designate certain professors as research professors. These faculty would have lighter teaching loads but

would be responsible for involving and supervising significant student research.

- In addition, the subcommittee recommended that:
- The Library further publicize its new electronic resources and continue to seek additional resources for acquiring books and periodicals.
- That lobbying efforts be expanded to help faculty obtain more grants and contracts. The program could start with local agencies and extend to California industries, state departments and agencies, and selected non-profit and U.S. government organizations. An updated listing of Cal Poly graduates working in various companies would be helpful in targeting possible company sponsors in California. Key administrators need the time to lobby off-campus for grants and research. These administrators include Deans and other appropriate upper level administrators.

The third general recommendation, that the University develop and formalize methods for tracking and archiving information on faculty scholarship and resources related to faculty scholarship, addresses weaknesses in the tracking and accessibility of such information. Specifically it is recommended that:

- A formal process be developed to collect and archive information on faculty scholarly activities, awards, funding, etc., in an Academic Affairs database. Input to the database could be a routine part of institutional assessment and would facilitate preparation of future self-study reports and processes for internal reviews and external accreditation reviews. The challenge will be to devise a framework with clearly specified categories that can be uniformly utilized by and applied to all academic programs on campus. The new CSU requirement that all faculty submit annual reports (FARs) that include information on scholarly activities, could be useful in beginning and maintaining this archival process.
- To more clearly assess the extent of publication in peer-reviewed journals, the Academic Senate formalize part of the program review process; for example, develop a standardized summary questionnaire requesting that departments under review submit pertinent information such as the number of FTEF, total publications, and peer-reviewed journal publications. The departments at Cal Poly encompass many diverse disciplines and classical peer-reviewed publications are not necessarily a proper professional activity in all of them. However, a consistent tabulation of publications will provide a gauge of this type of activity over time for those departments for which this is an important measure of faculty scholarship.
- The Foundation and the university utilize the same database with the same data fields for equipment inventory, and that fields be created within the database that would facilitate a search for research equipment. The database should be easily searchable by university or Foundation employees via a World Wide Web interface. This would provide a valuable central archive and means for faculty to identify and access specialized equipment and facilities.

In summary, our self-study of faculty scholarship has identified both strengths and weaknesses in this aspect of the intellectual environment at our university. The recommendations contained herein would address some of the weaknesses and permit further development of the knowledge, talents and special skills of our faculty. This, is turn, would enhance the intellectual environment of the campus, making it a more dynamic and exciting *center of learning*.

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Please send your suggestions and responses to the WASC Coordinating Office

Appendices

Appendix I.3.A.

Information on faculty awards and recognition:

- ***Seven Program reviews (Appendix I.3.A1-8)***

- **The Credit Report (Appendix I.3.A9-16)**

Available in the Academic Programs Office hard copy only

Appendix I.3.B.

Inventory of CPSLO policies and programs that support faculty professional development and scholarship

Inventory of CPSLO Policies and Programs that Support Faculty

Professional Development and Scholarship

Source	Content
CAM Section 120	Among the four "Fundamental Objectives" of Cal Poly is the objective of "Intellectual, professional, and personal growth among faculty and students."
CAM Section 341.1	Within campus policies for Promotions, Retention, and Tenure (RPT) is the following statement: "Evaluation criteria shall emphasize teaching performance, but also should include professional growth and achievement. Although teaching effectiveness is the primary and essential criterion, it alone is not sufficient for retention, tenure, and promotion."
CAM Section 386.1	"Leaves of absence with pay may be granted faculty members for purposes of research, study, creative activity, service or travel appropriate to one's position at the University." Sabbatical leave, for which faculty are eligible after six years of full-time service, provides compensation at one quarter at full pay, two quarters at three-quarter pay, or three quarters at half pay.
CAM Section 451.4	"Cal Poly faculty are encouraged to accept appropriate university-sponsored overseas assignments." Faculty serving in overseas appointments receive consideration for RPT equivalent to that received for service on campus.
CAM Section 452.1	(Recognized) "Research projects may include: community service research, institutional research, research in the CSU graduate programs, and individual faculty research."
CAM Section 452.4	Full time faculty members may undertake research projects for extra compensation up to "the equivalent of 1/4 the full-time load."

CAM Section 452.5D	"Faculty members employed on an academic year basis may be additionally employed full time on research projects for not more than 15 weeks in any one calendar year."
Constitution of the Faculty of Cal Poly, Article 11, Section 2	"The primary responsibility of ... the faculty is to seek truth and to encourage the free pursuit of learning in their peers and students. To this end, they devote their energies to developing and improving their scholarly performance."

Inventory of CPSLO Policies and Programs that Support Faculty Professional Development and Scholarship

Source	Content
Faculty Resume Worksheet for Retention, Promotion and Tenure	Four evaluation categories determine promotion and tenure decisions: A. Background/Experience, B. Teaching-Related Activities, C. Professional Growth and Development, D. Service. Category C includes "activities such as research; consulting; commissions; patents; copyrights; creative or artistic achievement; relationships with... industry; publication; editorial work; workshops; conferences."
Admin. Bulletin 81-2	"Faculty may pursue classical research activities Similarly, faculty in the humanities and arts who develop new art forms and expressions are pursuing a form of research appropriate to their discipline."
Admin. Bulletin 81-2, Section III	"The University will treat professional development as a high priority, second only to its teaching mission.
Admin. Bulletin 82-, Section IV	Procedures for review of degree programs call for information to answer "What research or other special projects are the dept. faculty pursuing" and "What other faculty development programs are present... and planned."
Admin. Bulletin 85-1	"(Cal Poly) has responsibility for the administration of sponsored conferences. The goals of conferences are (1) contributing to faculty and staff development by: [a] enhancing the professional development of faculty" (plus other goals)

Admin. Bulletin 85-2	"Excellence in teaching is the primary purpose of the University. Professional growth and development is essential to meeting this goal." The Bulletin goes on to describe avenues of development as "The generation of knowledge concerning teaching or the discipline" and "it is important... that each faculty member carefully consider and document general plans for professional development."
Admin. Bulletin 85-2	"(although) current facilities utilization formulas do not recognize the need for facilities to support the teaching effort through faculty development... Adequate recognition must be given to provide facilities for both teaching and professional development."

Inventory of CPSLO Policies and Programs that Support Faculty

Professional Development and Scholarship

Source	Content
Admin. Bulletin 85-3	"(Cal Poly) is committed to the following fundamental objectives: ... (4) Intellectual, Professional, and Personal Growth Among Faculty and Students." "faculty members develop professionally through organizations, creative activity, consulting, professional leaves or applied or basic research."
Admin. Bulletin 87-3	"The Bulletin gives guidance concerning the rationale and procedures for establishing institutes and centers." "The functions of an institute or center may be: to provide opportunities for the professional development of faculty through basic and applied research and development activities"
Faculty Handbook (97-98)	Private Consulting - "Faculty members are allowed to be private consultants outside the University provided does not interfere with obligations to the university. Normally, consulting should not average more than one day a week."
Faculty Handbook (97-98)	Evaluations/Tenure - "Evaluations are based on: Teaching performance, Professional growth and achievement, Service, Student evaluation."
Faculty Handbook (97-98)	Research and Professional Development Grants - "The Grants Development Office assists faculty in identifying and obtaining external funding for research and other opportunities."

Faculty Handbook (97-98)	State Faculty Support Grants - The SFSG program supports research, scholarship, and creative activities designed to help faculty members remain current in their disciplines."
Faculty Handbook (97-98)	Assigned Time for Professional Development - "Faculty can apply for assigned time to prepare grant/contract proposals for external funding."
Faculty Handbook (97-98)	University Services Summer Awards - "(the CP Foundation) provides a total of $25,000 annually to assist minority and female probationary faculty in research and other scholarly activities."
Faculty Handbook (97-98)	Faculty Fellows Program - "The purpose of the FFP is to fund faculty to do short-term research projects on policy issues at the request of (state government)."

Inventory of CPSLO Policies and Programs that Support Faculty

Professional Development and Scholarship

Source	Content
Faculty Handbook (97-98)	Sabbatical Leaves - "leaves with pay may be granted to employees if the study, research or travel is determined to be of a nature valuable to the University." "eligible to apply after completing six academic years of full-time service."
Faculty Handbook (97-98)	Difference-in-Pay Leaves - "a faculty member is eligible after serving three years following the last leave."
Faculty Handbook (97-98)	Professional Leaves without Pay - "A professional leave without pay may be granted if its purpose benefits the university, such as research, advanced study, or professional development."
Guidelines for State Faculty Support Grants (1999)	"Because the program is intended to fund traditional research, scholarship and creative activities, the grant activity must be related to the generation of new knowledge and learning or, in the case of the arts, to experimentation in techniques and in the production of art works... four types of support: 1) Minigrants to $5000; 2) Assigned time; 3) A quarter leave; 4) Summer faculty fellowships."

Revised Strategic Plan (1996) Section on Faculty Scholarship	"Excellence in teaching is the primary purpose of the University. Professional growth and development is essential to meeting this goal."
Revised Strategic Plan (1996)	"Excellence in support of students and faculty is the primary goal of Cal Poly staff, and participation in activities that lead to professional growth and achievement is essential to meeting this goal."
Cal Poly Faculty Evaluation Form (AP1 09, 7/98)	"II. Professional Growth and Achievement: Consider such factors as the faculty member's original preparation and further academic training, related work experience and consulting practices, scholarly and creative achievements, participation in professional societies and publications, professional registration, certification and licensing."
College of Agriculture Personnel Policies & Procedures (1998)	"Professional development is intended to enrich and upgrade faculty knowledge and skills as well as to stimulate intellectual growth and professionalism." (A long list of specific appropriate activities is recognized.)

Inventory of CPSLO Policies and Programs that Support Faculty

Professional Development and Scholarship

Source	Content
Policies, Criteria, & Procedures for Academic Appointment, Reappointment, Tenure, and Promotion for the College of Business (1995)	"Faculty in the College of Business are required to engage in research which results in publications as a condition for tenure and promotion." "Consideration shall also be given to: (a) Professional development intended to enrich and upgrade faculty knowledge and skills; and (b) Professional activity intended to ensure intellectual maturity and dynamic professionalism."
College of Engineering Personnel Policies & Procedures	"The evaluation criteria shall emphasize teaching performance, but also shall include scholarly and creative achievements,"
College of Science and Mathematics Personnel Policies, Procedures, & Evaluation Criteria	"Faculty members in the College of Science and Mathematics are expected to engage in an active professional development program that involves creative activities, is capable of description and documentation, and that ensures the continuing development of the faculty member as a teacher and scholar."

Intellectual Property Policy (1999)	"The purpose of this policy is to encourage, support, and reward research and scholarship, and to recognize the rights and interests of the inventor or creator... (and others)." "The University's commitment to its educational mission is primary, and this policy does not diminish the right and obligation of faculty members to disseminate the results of research and creative activity for scholarly purposes."

Adopted: May 25, 1999

Appendix I.3.C.

Resolution on Development of a Research and Professional Development Infrastructure at Cal Poly

ACADEMIC SENATE

OF

CALIFORNIA POLYTECHNIC STATE UNIVERSITY

San Luis Obispo, CA

AS-527-99/R&PDC

RESOLUTION ON

DEVELOPMENT OF A RESEARCH AND PROFESSIONAL DEVELOPMENT

INFRASTRUCTURE AT CAL POLY

Background Statement: In 1996, the Academic Senate reconfigured its subcommittees. From this process, the Research and Professional Development Committee was formed and given the charge to assist in the development of research policies for the campus. Faculty on this committee, over the past two years, began identifying barriers to research on campus through a campus wide survey, and has prepared recommendations for creating an environment that supports faculty efforts in their scholarly work.

WHEREAS, Cal Poly is an institution known for its high quality of undergraduate education, where graduate programs have traditionally played a small role and faculty teaching of undergraduates has been the highest priority; and

WHEREAS, The Cal Poly Strategic Plan outlines a greater emphasis on research and other scholarly activities by faculty in the future; and

WHEREAS, The Research and Professional Development Committee was formed by the Academic Senate and given the charge to assist in the development of research and professional development policies for the campus; and

WHEREAS, The success of research and professional development on campus requires an investment of time by faculty and students, allocation of space, and commitment of fiscal resources by the university administration; and

WHEREAS, The processes of teaching, discovery, integration, and application through research and creative activities is crucial for the continued growth and development of a

community of faculty and student scholars; therefore be it

RESOLVED, That research and other scholarly activities be a factor in assigning faculty work loads; and be it further

RESOLVED, That research and other scholarly activities be a factor in assigning faculty workspace, facilities, and equipment without compromising the quality of undergraduate education; and be it further

RESOLVED, That campus resource allocations include considerations of research and other scholarly activities, without compromising the quality of undergraduate education; and be it further

RESOLVED, That research programs and proposed development efforts be encouraged and supported; and be it further

RESOLVED, That scholarly activities be given consistent recognition in retention, tenure, and promotional decisions at all levels of review; and be it further

RESOLVED, That research opportunities be encouraged as a valuable component of undergraduate education; and be it further

RESOLVED, That graduate curricula be encouraged and developed, including funding for recruitment of graduate students and for graduate assistants; and be it further

RESOLVED, That the Academic Senate approve the attached recommendations for research and professional development at Cal Poly, and that these recommendations be forwarded to the President and Provost of Cal Poly.

Proposed by: Research and

Professional Development Committee

Date February 22, 1999

Revised: May 18, 1999

Revised: May 25, 1999

RECOMMENDATIONS FOR A RESEARCH AND PROFESSIONAL DEVELOPMENT

PROGRAM AT CAL POLY

Cal Poly Mission Statement

As a predominantly undergraduate, comprehensive, polytechnic university serving California, the mission of Cal Poly is to discover, integrate, articulate, and apply knowledge. This it does by emphasizing teaching; engaging in research; participating in the various communities, local, state, national, and international, with which it pursues common interests; and where appropriate, providing students with the unique experience of direct involvement with the actual challenges of their disciplines, in the United States and abroad.

Importance of Faculty Scholarship

In Scholarship Reconsidered (citation), Ernest Boyer emphasized that teaching and research are both important scholarly activities of the professorate. In its strategic plan, Cal Poly has encouraged the four scholarships as defined by Boyer;

"Cal Poly endorses the broad definitions of the four types of scholarship set forth in the Carnegie report. The following thoughts extracted from the Carnegie report summarize the mission of teaching and scholarship at Cal Poly."

The scholarship of Teaching: As a scholarly enterprise, teaching begins with what the teacher knows. Those who teach must be well informed and steeped in the knowledge of their fields. Teaching is also a dynamic endeavor that must bring students actively into the educational process. Further, teaching, at its best, means not only transmitting knowledge, but transforming and extending it as well. In the end, inspiring teaching keeps scholarship alive and inspired scholarship keeps teaching alive. Without the teaching function, the continuity of knowledge will be broken and the store of human knowledge diminished.

The scholarship of Discovery: comes closest to what is meant when academics speak of "research". This scholarship contributes not only to the stock of human knowledge, but also to the intellectual climate of the University. Not just the outcomes, but the process, and especially the passion, giving meaning to the effort. The probing mind of the researcher is a vital asset to Cal Poly, the state, and the world. Scholarly investigations and/or creative activity, in all the disciplines, is at the very heart of academic life, and the pursuit of knowledge must be assiduously cultivated and defended. Disciplined, investigative efforts within the University should be strengthened, not diminished. Those engaged in the Scholarship of Discovery shall ask: What is known and what is yet to be discovered?

The scholarship of Integration: involves the serious, disciplined work of interpreting, drawing together, and bringing new insight to bear on original research. This scholarship can involve doing research at the boundaries where fields of study converge, or it can involve the interpretation and fitting of one's own research -- or the research of others -- into larger intellectual patterns. Integration means making connections across the disciplines, placing the specialties in larger context, illuminating data in a revealing way, often educating non-specialists, too. Those engaged in The scholarship of Integration shall ask: What do the research findings mean and is it possible to interpret what has been discovered in ways that provide a larger, more comprehensive understanding?

The scholarship of application: involves using knowledge to solve problems. This scholarship is a dynamic process where new research discoveries are applied and where the applications themselves give rise to new intellectual understandings. This scholarly activity, which both applies and contributes to human knowledge, is particularly needed in a world in which huge, almost intractable problems call for the skills and insights of university faculties. Those engaged in the scholarship of application shall ask: How can knowledge be responsibly applied to consequential problems, and how can social, economic, and other problems define an agenda for scholarly investigation?

Cal Poly continually seeks ways to integrate the four types of scholarship, for the purpose of maintaining high quality academic programs. The benefits of faculty scholarship are many. Some examples are:

- Scholarship enables faculty to maintain currency in their disciplines
- Scholarship keeps teaching relevant and lively
- Scholarship can be revenue generating
- Scholarship provides opportunities for undergraduates to engage in sustained work on demanding, multifaceted problems in which they learn to define and communicate their own solutions, and to develop critical thinking and analytical skills.
- Scholarship provides opportunities for students to acquire core competencies that are valued by employers.
- Scholarship enhances the reputation of the individual and the University
- Scholarship provides an avenue for creativity and self expression
- Scholarship provides a means for faculty to reflect on the learning Process
- Scholarship provides opportunities for interaction with working professionals and with scholars at other Universities
- Scholarship provides for extended individual interaction between faculty and students

The National Science Foundation recently undertook an extensive review of science, mathematics, engineering and technology education. Its report; Shaping the Future: New Expectations for Undergraduate Education in Science, Mathematics. Engineering and Technology, stated that; "all students have access to supportive, excellent undergraduate education in science, mathematics, engineering, and technology, and all students learn

these subjects by direct experience with the method and process of inquiry. Every student should be presented an opportunity to understand what science is and is not, and to be involved in some way in scientific inquiry, not just a 'hands-on' experience."

Need For Policy

To operationalize this commitment to scholarship, Cal Poly needs to develop new policies and revise existing policies to support scholarly activities. A recent survey conducted by this committee of the Cal Poly faculty revealed that although there is some level of support for the research activities of its faculty, Cal Poly does not provide the necessary support to meet the professional development needs of faculty and students in the area of research. The following barriers to professional development were identified by the faculty survey:

1. Unavailability of funds to maintain a professional development program;

2. Lack of policy for research/creative activity space allocation;

3. Inequitable teaching loads;

4. Inadequacy of "seed" funds to develop or expand creative/investigative activities;

5. Insufficient support for graduate courses and programs;

6. Lack of standardized RPT criteria and acknowledgement of research as a valued activity;

7. Unavailability of functional, "supportive" intellectual environment;

8. Ambiguous policy regarding intellectual property of inventors.

Recommendations of the Research and Professional Development Committee

1.0 Make funds available to maintain a professional development program:

It should be the responsibility of each college to allocate and administer resources to maintain a professional development program. It is recommended that such resources be allocated to faculty based on professional progress and productivity.

2.0 Provide space for creative/investigative activities:

It is recommended that each college ensure that adequate space is provided to support creative and scholarly activities, and develop criteria for allocating such space to its faculty and students.

3.0 Equitable teaching loads:

Use flexibility in assigning faculty workloads to support scholarship. Scholarship and creative activities represent significant and valuable contributions to the University, and should be recognized in assigning faculty workloads. Efforts should be made in the assignment of work loads (e.g.; numbers of courses requiring preparation, contact hours, class size, committee assignments) to ensure that all faculty, and particularly junior faculty, have quality time to devote to the pursuit of their scholarship. In addition, junior faculty should be offered a reduced teaching load in their first year of employment.

4.0 Make available creative/investigative "seed" funds:

Cal Poly should establish a campus wide research fund to support the initiation of research programs by faculty, and in particular, junior faculty. These funds would supplement funds currently available through programs such as the State Faculty Support Grants Program. In addition, start up funds should be made available for new or junior faculty, and should be offered as part of the recruitment package.

5.0 Promote graduate curricula:

Graduate programs are an important complement to faculty scholarship. Resources should be dedicated to

strengthening, expanding and initiating new graduate programs, particularly in disciplines relevant to the polytechnic emphasis of the campus. Since graduate level courses require a greater in-depth coverage of the subject matter and a greater student-teacher interaction, they should be given an additional weight factor when calculating WTU's.

For questions regarding the WASC Self Study contact the [WASC Coordinating Office](#).