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White Paper: The Cal Poly Engineering Scholar

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Background

During the 2012 winter and spring quarters, I was actively engaged in the college's retention, promotion and tenure (RPT) and related processes, reviewing files, making recommendations and listening to various faculty speak. This was my first year at Cal Poly and my introduction to the faculty review culture and the processes of the college and the university. I ended the 2011-12 RPT and post-tenure review cycle with a number of observations1 which provide a platform for topics in this paper.

These synthesized observations are part of a recent and larger set of activities at Cal Poly focused on the role of scholarship. As follow-up to a December 2009 essay on the teacher-scholar model in the WASC Capacity and Preparatory Review Report, Cal Poly’s Academic Senate adopted a resolution in March 2011 on the teacher-scholar model. In spring 2012, the Academic Senate passed a resolution2 requesting the provost to direct all departments and colleges to “review and approve RPT guidelines in a discipline-specific manner,” and to align criteria and definitions to the teacher-scholar model. On September 6, 2012, the college’s leadership3 group conducted a preliminary discussion on the Cal Poly Engineering Faculty Scholar. The Academic Senate held a teacher-scholar retreat on September 14, 2012 for the purpose of reflecting on questions related to the RPT process. The minutes, which are located at the Senate’s website archives, demonstrated variance of opinion regarding expectations for the teacher-scholar model.

On October 15, 2012, Provost Enz Finken issued a charge to departments and colleges to undertake the RPT review work as was earlier requested by the Academic Senate. The charge is broad-based, going far beyond incorporation of the teacher-scholar model. The charge has a goal of creating robust RPT, post-tenure review and lecturer review processes. The Provost asked us to reassess our techniques for evaluating teaching performance; to set up

1 These college-level observations are the result of synthesizing discrete examples from across the college and represent a range of practices. This is not to imply that every department exhibits each of these observations.

2 “Resolution on Retention Tenure and Promotion,” AS-752-12, Adopted May 29, 2012 by the Academic Senate of Cal Poly

3 The college’s leadership group includes the dean, associate and assistant deans, department chairs and dean’s-level support staff.
expectations about the role and responsibilities of faculty RPT reviewers; to develop mechanisms that value the four "I's": interdisciplinary, internationalization, inclusivity and innovation; and to carry out our duties in a respectful, collegial, and professional manner. Provost Enz Finken asked the academic units to send drafts approved at the department and college levels to her by the end of the winter quarter for her review. The goal is to have revised documents in place by the start of the fall 2013 quarter.

**Purpose**

Anecdotal evidence suggests that the college generally embraces the Academic Senate’s teacher-scholar model. Anecdotal evidence also suggests that many in the college are unfamiliar with the document by Ernest Boyer that underpins the resolution. Boyer’s treatise is considered by many to be one of the most important statements about the role of scholarship in the academy. Through his conceptualizations, Boyer offers a broader view of scholarship that goes beyond traditional forms of published scholarship. By underpinning AS-725-11 with Boyer, the resolution’s meaning is enriched and made robust. It provides an overarching vision for all departments and colleges that could include Boyer’s four types of scholarship (discovery, application, integration, and teaching), the engagement of students in scholarship, the positive relationship between the scholarship of teaching to high quality learning environments, and the provisions for individual variations in the balance of contributions. Neither Boyer nor the teacher-scholar resolution, however, provides discipline-specific definitions about scholarship and specifics about criteria and standards. The central question of evaluation is missing from these documents. This is our job.

As part of Provost Enz Finken’s charge, she asked the departments to consult “as to whether it is desirable to establish college-wide parameters.” The departments’ comments about this were collected by the department chairs and relayed to me on October 30. One department expressed their intent to revise their RPT documents at the department level without the need for a college wide discussion. Many other departments expressed an interest in having this conversation conducted first at the college level prior to initiating a process of revising department-level documents.

This white paper is intended to spark and organize college-level discussions for the eventual task of integrating a college definition of the teacher-scholar into our periodic review and RPT standards. It is intentionally focused on ideals and values vs. evaluation standards, because

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4 “Resolution on Defining and Adopting the Teacher-Scholar Model,” AS-725-11, Adopted March 8, 2011 by the Academic Senate of Cal Poly.

5 “Scholarship Reconsidered, Priorities of the Professoriate,” Ernest L. Boyer, 1990, The Carnegie Foundation for the Advancement of Teaching
these foundational thoughts are easily lost and never recovered, if the conversation starts with codifying procedures and establishing review criteria.

**Responsibilities of the Scholar**

Although the Academic Senate’s resolution relies extensively on Boyer’s “Scholarship Reconsidered,” few have read his treatise completely. Many have perused Chapters 2 and 3, often with the goal of trying to determine what qualifies as scholarship and the role of publishing. Boyer, however, doesn't provide specific answers to these questions. What Boyer does in his landmark book is to broaden our notion of scholarship and to holistically discuss the importance of faculty scholarship. In Chapter 7, Boyer links the role of the scholar in our changing world. While written before 1990, his ideas around the importance of scholarship, in all its forms, might be even more important today.

Our world is changing at an ever-accelerating pace. Knowledge and its applications are growing exponentially. Technology is poised to disrupt how people learn, and likewise, could disrupt the teaching environment. One only needs to look at the fast moving phenomena of massive open on-line courses (MOOCs) to wonder about what the next ten years will bring to higher education.⁶

I draw the reader’s attention to a few quotes from Boyer’s Chapter 7:

> Without the vigorous pursuit of free and open inquiry this country simply will not have the intellectual capacity it needs to resolve the huge, almost intractable social, economic, and ecological problems, both national and global. Nor will the academy itself remain vital if it fails to enlarge its own store of human knowledge ... the work of the academy must relate to the world beyond the campus.

Later in this same chapter, Boyer states:

> But, when all is said and done, faculty, themselves, must assume primary responsibility for giving scholarship a richer, more vital meaning.

Finally, Boyer concludes Chapter 7 and his book with:

> And as we look at today’s world, with its disturbingly complicated problems ... even the best of our institutions must continuously evolve. To sustain the vitality of higher education ... a new vision of scholarship is required.

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⁶ The November 14, 2012 posting of ASEE’s First Bell, a news clipping email service, reports on the American Council on Education agreeing to begin the process of evaluating a subset of Coursera courses for possible credit recommendations. The report notes that some universities are already incorporating MOOCs into their programs.
I believe that society has made an investment in faculty. It has provided members of the professoriate the opportunity to pursue and achieve an advanced education beyond the baccalaureate to then use those intellectual talents to benefit society. We have the in-depth knowledge and the associated skills to find meaning in complicated problems and situations, to create new ideas or applications, to contribute to the growing knowledge base, to improve upon ideas and solutions, or to innovate. At Cal Poly, where teaching is our primary focus as reflected in our various operational practices, our engagement in “interesting scholarly things” can be appropriately accomplished through the scholarship of teaching and/or by engaging our students in scholarship through applied and integrative scholarly activities that also create deep learning experiences.

**Engaging Our Students via Scholarly Practices**

A study by George Kuh, Daniel Chen and Thomas Laird\(^7\) attempted to answer why teacher-scholars matter to undergraduate students by drawing insights from the nationally-administered Faculty Survey of Student Engagement (FSSE) and the National Survey of Student Engagement (NSSE). Although the teacher-scholar model is conceptually appealing, the authors wondered if it impacts the experiences and learning of students. By examining the data collected in 2005 and 2006 from nearly 30,000 faculty and over 65,000 randomly-sampled seniors from four-year colleges and universities in the United States, they have made some observations about the teacher-scholar that are of particular importance to us at Cal Poly. These are:

- Faculty who are actively engaged in research, place value on undergraduates doing research and take a deeper approach to their teaching\(^8\).

- At institutions where faculty value undergraduate participation in research, students tend to report greater gains (in learning) across various areas.

- Of special note, at institutions where faculty do not place much emphasis on deep learning, the effect of participating in research is actually negative, while it is positive at institutions where deep learning is emphasized.

Although the authors use the word “research,” I encourage interpretation of these statements within the broader concept of “scholarship.” Although one must recognize the global nature of


\(^8\) These findings could be directly applicable to Cal Poly Engineering if we fully embrace the four types of scholarship. In particular, our students and faculty regularly engage in applied scholarship through senior projects, theses, co-curricular design competitions and co-curricular service projects.
the FSSE and NSSE data and its inability to directly correlate the practices of individual faculty to students, the study is an objective analysis of some order. I think this analysis strengthens the value of the teacher-scholar model, making it even more relevant for an institution like ours focused on the undergraduate.

Beyond the study, the Cal Poly Teacher-Scholar Model gives legitimacy to the broad-range activities in which the members of the faculty already engage. It provides a link between those activities and student learning, which then easily integrates the educational mission\(^9\) of the college into the careers of the professoriate.

**Our Collective Interest in Faculty Members as Scholars**

Beyond creating and maintaining high-quality learning environments through the engagement of students in scholarship and active learning, and beyond creating and maintaining faculty processes that are sound and fair, the institution has an overarching interest in the scholarship of its faculty. Simply, the reputation and relevancy of the institution resides as much with the many activities of the faculty as it does with the endeavors of its graduates. An institution with a faculty whose scholarly efforts are in sync with its mission and vision is an institution that is on a pathway of success. And, when an institution is successful, the work of the individual becomes easier to achieve and sustain. It is circular: Institutional reputation benefits the individual (faculty and student); Individual and team successes enhance the reputation of the institution. As noted by the University of California's Report of the University-wide Task Force on Faculty Rewards:\(^{10}\)

... [T]he University's success in accomplishing its mission depends on the selection and advancement of its faculty. The criteria for appointment and promotion of faculty are critically important to ensure the continuing vitality of the University.

When I look to our college’s vision\(^{11}\) statement, the phrase to meet “the challenges of the 21\(^{st}\) century” relates directly to scholarship. Scholarship is an important mechanism for staying abreast of the advances in our technical fields so we can continue to transform students into

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\(^9\) The College’s mission - developed through a collaborative process and approved June 8, 2012 - is: The College of Engineering provides an excellent Learn-by-Doing education and graduates in-demand, Day One-ready professionals.


\(^{11}\) The College’s vision approved June 8, 2012 reads, “As a national leader in engineering education, the College of Engineering transforms students into world class, innovative and collaborative engineers to meet the challenges of the 21st century.”
world class engineers. Scholarship, especially through the scholarship of teaching, can help us keep abreast of the ever-evolving ideals of the engineering practitioner. Today, these ideals include the ability to collaborate, innovate and work globally across cultures. They also include system thinking skills, and being adaptable, courageous, professional and competent in the discipline. The scholars of teaching might also help us understand how to handle — in a manner complimentary to our mission — the emerging landscape of education being shaped by the fast-moving applications of technology in teaching and learning. Assumptions that guided us for the last half century may no longer entirely hold today, underscoring the need to continuously engage more directly with the realities of contemporary life through scholarship\textsuperscript{12}.

Exploiting the circular relationship further, scholarship in its many forms can also sustain the faculty’s energy and creativity which then attracts highly qualified students. As emphasized by DeMillo\textsuperscript{13}:

Highly qualified students also attract the kind of faculty members who shine in the classrooms with bright, engaged communicative students. Creative and energetic faculty members mean academic programs that over time build a university’s reputation, attracting better students – the kinds who are more likely to bring ... some years down the line, alumni donations.

\textbf{Scholarship: What is it?}

In an article by Bruce Henderson\textsuperscript{14} about faculty engaging in “interesting scholarly things,” the author notes that when the faculty talks about scholarship, it quickly moves to RPT and focuses our attention on the products of scholarship rather than the process. We do not define scholarship from within our own context. We do not have open conversations about the value of scholarship to our students, our institution, and our careers. It follows that we then miss the benefits of making public a balanced view of scholarship because we don’t share our processes and results to those outside our institution. Furthermore, although we obsess about the measures and metrics of scholarship, we fail to develop the means for conducting effective evaluations of scholarship in its broader sense.

\textsuperscript{12} Clayton Christensen in his special report for the Nieman Foundation (as excerpted by Lewis D’Vorkin, “Disruption Never Ends,” Forbes, November 19, 2012) takes on the emotional response by traditional occupations like journalism, physicians, and teachers to these technology-enabled disrupters issues. Christensen says “I think in each case the reaction … is to justify why they shouldn’t need to change, and that everybody else is wrong.x The instinct is to look down their noses and say, ‘They’re not as good as we are.’”


Faculty and administrators from Pennsylvania State University tackled the question of scholarship as part of their work to create a multidimensional model that conceptualizes teaching, research and service as a continuum of scholarship\textsuperscript{15}. They defined scholarship as:

...the thoughtful discovery, transmission, and application of knowledge. It is informed by current knowledge in the field and is characterized by creativity and openness to new information, debate and criticism. For a scholarly activity to be recognized, utilized, and rewarded, it must be shared with others in appropriate ways.

In their book "Scholarship Assessed," Charles Glassick, Mary Taylor Huber, and Gene Maeroff studied the central question of how to evaluate scholarship\textsuperscript{16}. Through their extensive review of the literature and scores of faculty handbooks and policy statements, and through their use of several surveys, the authors found commonalities across the disciplines and institutions. In particular, they identified the commonalities of the scholarly process. All works of scholarship — whether discovery, integration, application or teaching — possess a common sequence of activities that have given rise to scholarly standards. These qualitative standards of scholarship include:

1. Clear goals. Does the scholar:
   a. State the basic purposes of his or her work clearly?
   b. Define objectives that are realistic and achievable?
   c. Identify important questions in the field?

2. Adequate preparation. Does the scholar:
   a. Show an understanding of existing scholarship in the field?
   b. Bring the necessary skills to his or her work?
   c. Bring together the resources necessary to move the project forward?

3. Appropriate methods. Does the scholar:
   a. Use methods appropriate to the goals?
   b. Apply effectively the methods selected?
   c. Modify procedures in response to changing circumstances?


4. Significant results. Does the scholar:
   a. Achieve the goals?
   b. Add consequentially to the field?
   c. Open additional areas for further exploration?

5. Effective presentation. Does the scholar:
   a. Use a suitable style and effective organization to present his or her work?
   b. Use appropriate forums for communicating work to its attended audience?
   c. Present his or her message with clarity and integrity?

6. Reflective critique. Does the scholar:
   a. Critically evaluate his or her own work?
   b. Bring an appropriate breadth of evidence to his or her critique?
   c. Use evaluation to improve the quality of future work?

The authors contend that these qualitative standards are appropriate to the full range of scholarly work.

They acknowledge the role of documentation in supporting the assessment process and recognize that some scholarly activities are more readily documented than others. Documentation is defined as "the evidence that enables the scholar and his or her colleagues, even those who are not specialists in the same field, to apply a set of agreed upon standards to a body of scholarly work." As a secondary benefit, the authors also remind us that "documentation, done well, promotes better scholarship by engaging scholars more actively in making a case for their achievements." Documentation can encourage more reflective practice and improvement. The practice of documentation increases one's skill in communicating complicated ideas to larger numbers of audiences.

**Assessing Scholarship**

To enable and assess a broader scope of scholarship, we must be open to an array of presentations and materials, which could include, to name a few, public displays of applications, active presentations of original works, rigorous peer review and utilization in practice. As noted by Glassick, Huber and Maeroff, "Evidence and standards that allow colleagues to make reliable judgments about quality without an overreliance on quantification" are important to assessing the broad array of scholarship as defined by Boyer. This requires the college, however, to do the hard work of describing examples and conducting more thorough reviews that are well-documented.
I believe that assessment is a keystone to assuring quality and fairness and achieving goals such as: creating systematic and objective faculty evaluation programs; integrating the work of the professoriate to the mission and vision of the institution; and recognizing that a responsive, relevant institution with a strong position towards future success is intimately linked to the work of the faculty and the success of its students.

**In Conclusion**

Let's not kid ourselves. Our current RPT and review processes can be improved upon. We are hesitant about external peer review. Is this because we have not developed the qualitative and mission-appropriate standards that would stand the external test? Or, are we merely motivated by pedantry and pride, believing that only we know what is best for Cal Poly? We have significant variances of scholarly goals and teaching expectations between departments. The quality of the reviews and feedback is also variable. We rely on limited assessment tools and procedures for evaluating teaching, our primary mission. We lack an approved, up-to-date college-level document. We therefore rely on the university-level document to provide the necessary standards for evaluation.

We owe it to ourselves to tackle the standards and criteria of RPT and the other review processes. We owe it to ourselves to do this in a scholarly and professional way with an eye on our future, and with less concern about our past. Scholarship must be defined. It should be broad, but also assessable. Professional development — what everyone should be doing to maintain basic currency — must be distinguished from scholarship, which is a purposeful set of activities intended to contribute to, or advance, knowledge through dissemination, critique, and reflection.

All scholarship is professional development; not all professional development, however, is scholarship. Similarly, teaching well is not the same thing as being a scholar of teaching, although the scholar of teaching often is a good teacher who creates excellent learning environments.

We need to tackle the question of consulting: How can it be documented and presented? What is the value of consulting to the college and our students? Is it scholarship? And what are the standards for evaluation? Without a thoughtful discussion that acknowledges the institution's interests and vision and has been translated into a set of common values and standards, we will continue to be conflicted about how consulting plays out in RPT. This is something that Cal Poly
Engineering can bring to engineering education that other institutions do not. Can we better articulate the issue?

Similarly, we need to balance scholarly expectations against instructional loads. The current work of the college’s task force on a common WTU framework is an important step towards that end. Their work may provide the college with a good starting point to which future evaluations are informed by uniform definitions and common understandings of loads. With this, the merits of specific contributions in teaching, scholarship, and service can be better appreciated.

As we engage in deeper conversations about scholarship and the teacher-scholar model, I'm sure that other important questions will emerge that will require study and thought. Our future does depend upon a closer alignment of our faculty evaluation processes with the teacher-scholar model and with our college's mission and vision. I encourage our college to look to the assessment suggestions of Glassick, Huber, and Maeroff to create a framework of standards and review tactics that can welcome various diverse and valuable expressions of the Cal Poly Engineering Scholar. Our intellectual well-being requires such a framework, as does our future success as a college.