RESOLVED: That the Academic Senate of Cal Poly endorse the attached proposal for establishment of the University Center for Innovation and Entrepreneurship.
To: Rachel Fernflores, Chair  
Academic Senate

From: Robert D. Koob  
Provost and Vice President of Academic Affairs

Date: November 19, 2009

Copies: Susan Opava  
Dave Christy  
Lou Tornatzky  
Jonathan York

Subject: Request for Academic Senate Review of the  
Proposal for the Establishment of a University  
Center for Innovation and Entrepreneurship

Attached is a copy of a proposal to establish a University Center for Innovation and Entrepreneurship. In accordance with campus policy for the Establishment, Evaluation and Discontinuation of Centers and Institutes, this proposal received conceptual approval by the Academic Deans' Council at its meeting on November 16, 2009. I would now appreciate the Academic Senate's review of this proposal. Simultaneously an ad hoc committee, appointed by me, will review organizational and financial aspects of the proposed center. Please feel free to contact Drs. Lou Tornatzky or Jonathan York in the Orfalea College of Business, authors of the proposal, should you have any questions or would like them to make a presentation to the Academic Senate.

Thank you, and if you have any questions, please do not hesitate to contact my office.

Attachment
Proposal for a University Center for Innovation and Entrepreneurship

California Polytechnic State University

Submitted by

Louis G. Tornatzky, Ph.D. Jonathan L. York, Ph.D.
Orfalea College of Business

October, 2009

Submitted to

Dave Christy, Dean, Orfalea College of Business
"The core elements of an entrepreneurial university are: a strengthened steering core with a clear vision and mission, boundary spanning structures and mechanisms to interact with the “outside” world (external stakeholders), a diversified funding base (less state funding), inter- and multidisciplinary activity and an integrated entrepreneurial culture."

from the World Economic Forum’s 2009 Report on entrepreneurship education

**Background and Purpose**

This proposal develops the rationale and goals for a University Center for Innovation and Entrepreneurship at Cal Poly. The proposed Center would enhance classroom and field-learning opportunities for students across the campus, encourage interdisciplinary scholarly research and publication, and be a resource for the university as it evolves its role in innovation, creativity, entrepreneurship, technology commercialization and regional technological and economic development. Moreover, it would perform an important coordinating and clearinghouse role among students, faculty and staff who are deeply interested in these issues.

The proposal has its origins in informal discussions between Dr. Tornatzky and Dr. York, with Dr. Susan Opava, Dean of Research and Graduate Studies at Cal Poly, Dr. Robert Koob, Provost, and Dr. Dave Christy, Dean of the Orfalea College of Business on how to best expand the mission interests of the institution in the area of entrepreneurship and innovation. These preliminary interactions have been supplemented with discussions with a much larger cohort of interested parties, both on campus and in the community (Appendix A) several of whom would be formally affiliated with the Center when it launches. Based on these interactions, and research that we have conducted on national trends and practices at other universities, we believe that there is a strong case for the formation of a University Center for Innovation and Entrepreneurship that could yield numerous programmatic enhancements at Cal Poly, such as:

- An enlarged, focused and more interdisciplinary program of undergraduate and graduate instruction in innovation and entrepreneurship;
- A significantly enhanced effort to foster hands-on entrepreneurial experiences, both within the university and in collaboration with community organizations and entrepreneurs, consistent with the polytechnic and learn-by-doing orientation of the institution;
- A more robust program of research, scholarship and policy studies dealing with entrepreneurship and innovation;
- A partner in Cal Poly’s increasing involvement in technology commercialization in evaluating, “incubating,” and supporting faculty and students’ entrepreneurial activities;

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• An active participant in and supporter of Cal Poly's role in regional economic development, especially where it comes to technology-based start-ups and innovative growth practices in existing companies;

• An administrative and philosophical “home” and/or support system for entrepreneurial activities and programs such as intra- and inter-university competitions, lecture series and symposia;

• A venue for domestic and international collaboration with universities with comparable missions and interests in innovation and entrepreneurship (e.g., Politecnico di Milano, Helsinki University of Technology, Chalmers University of Technology, Grand l’Ecole des Mines de Paris) with which Cal Poly already has significant or budding exchange relationships.

It should be emphasized that while many of the above activities are being implemented at some level at Cal Poly, their full flowering will benefit from the establishment of a Center. The experience of many universities is that a Center can leverage significant external support in the form of dedicated gifts, grants and contracts, as well as function as a lightning rod for change. We also believe that the Cal Poly context and “brand” will be a significant asset. However, only an officially sanctioned and approved Center can be competitive in the soft money arena.

In the following pages, the authors further develop the argument for a University Center for Innovation and Entrepreneurship located administratively in the Orfalea College of Business along with a concurrent coordinating relationship with the Dean of Research and Graduate Programs consistent with its campus wide interdisciplinary vision. The two principals leading this development effort (York and Tornatzky) have appointments in OCOB, but from the beginning of the planning effort many individuals from other colleges have been involved. Moreover, as the center evolves it will truly become a University Center in terms of the breadth of its activities, units and individuals involved and its face to the world.

Background and Context

Entrepreneurship and innovation are topics that preoccupy academics, business and government leaders, and the country’s imagination. If one “Scholar-Googles” on either term, the resulting search yields hits in the hundreds of thousands. Nationally prominent private and government foundations (e.g., Ewing Marion Kauffman, National Science Foundation) have focused and expanded their program agendas on fostering entrepreneurship and innovation. Even in a time of economic disorder, that portion of the U.S. and California economies that focuses on technologically innovative entrepreneurial startups remains the envy of the world.

Most important from the university perspective is the fact that the growth of entrepreneurship centers, research programs, and dedicated positions (e.g., endowed chairs) has been phenomenal over the past decade. For example, the Global Consortium of Entrepreneurship Centers has over 200 sanctioned university programs as members.
Almost all of these Centers focus on both innovation and entrepreneurship as tightly linked activities. Also, a 2004 Kauffman Foundation study found 404 endowed chairs in entrepreneurship in the U.S. alone. There is also a growing link between entrepreneurship education and research and regional economic development, particularly university technology transfer resulting in the establishment of technology-based startups. Both of the authors of this proposal have been involved in the practice and study of these phenomena (e.g., NSF-supported national benchmarking\(^2\)).

While the small enterprise, entrepreneurial portion of the US economy has been the major source of new jobs for over two decades, there is a subcomponent – the “gazelle” companies – that account for a disproportionate fraction of that economic growth. Typically, gazelle firms have been particularly clever and innovative in their products and business models, often commercializing research-based innovations from universities.

There is also a strong relationship between successful entrepreneurship and the mastery of innovation processes and technological creativity. The more successful entrepreneurs tend to be more innovative, and the more innovative companies tend to be entrepreneurial – or “intrapreneural” in the case of larger companies. By illustration, a business best-seller entitled *The Innovator’s Dilemma*\(^3\) has documented the extent to which most large corporations are unable to adopt or implement radical technological innovations and spend most of their efforts on incremental, cost-saving changes to production processes or product features. Thus the proposed Center must place significant effort on understanding and implementing innovation processes wherever they occur. While the scholarly literature in this area is large\(^4\), there are nonetheless many opportunities for Cal Poly to make a contribution.

As the World Economic Forum report *Educating the Next Wave of Entrepreneurs* notes, “The design of adequate framework conditions by universities and governments should not only serve to support entrepreneurship education and the recognition of credible entrepreneurial opportunities, but also to establish the further entrepreneurial ‘support chain’ of technology commercialization and academic spin-off activity in higher education contexts.”\(^5\)

For example, in the public policy domain over the past 15 years, the vast majority of state governments and regional organizations have tuned their economic development strategies so as to pay more deliberate attention to nurturing technological innovation – particularly with state-based research universities as key players\(^6\) - with the hope that it

will help anchor high wage, high technology companies in their region. Increasingly these public policy initiatives are focused on the nurturance of entrepreneurial ventures, through the establishment of business incubators\textsuperscript{7}, public-private seed funds and university-based entrepreneurship centers.

At the same time, the public sector continues to struggle with the problem of how to serve its constituencies more effectively. Often this discussion involves not what to do, but how to export the culture and practices of private sector entrepreneurship to the public domain, and how to effectively foster innovation processes and disseminate and implement innovations that are already proven. This problem repeats itself in settings as disparate as public education, sustainability or mental health.

**Why Is a Center Needed?**

This proposal for the establishment of the University Center for Innovation and Entrepreneurship at Cal Poly represents the coming together in time of several significant activities and trends that make this the right time:

- An increased focus on technology commercialization at Cal Poly at both university and college levels, with a rapidly growing interest in leveraging research into new companies;
- Significant growth in faculty research and grant activity, particularly in areas that have entrepreneurial potential and incorporate interdisciplinary innovation;
- Establishment of a tenure track faculty position in entrepreneurship in the Orfalea College of Business with the concomitant energizing of the entrepreneurship curriculum;
- Establishment of a clearer role for Cal Poly in regional economic development efforts and a more robust series of conversations between the university and relevant organizations (e.g., SLO Chamber of Commerce);
- Increasing cross-departmental research cooperation with entrepreneurship potential;
- Increased faculty interest and involvement in technology innovation and commercialization, expressed in both new and revised curricula as well as in new approaches to long-standing Cal Poly traditions, such as the Senior Project;
- Efforts on behalf of Cal Poly and the community to better identify and catalogue the significant entrepreneurial efforts of Cal Poly alumni over the past decade, resulting in a large list of potential supporters of a variety of entrepreneurial activities and research;
- Development of specialized facilities with implications for entrepreneurship instruction and practice, such as a recently configured Entrepreneurial Ideation

Laboratory (EIL, 38-133), in the Orfalea College of Business, that is patterned after approaches pioneered by IDEO and in Stanford design facilities.

What Will the Proposed Center Do?

Based on the existing research on and practice of innovation and entrepreneurship—and the shortcomings therein—we believe that a strong case can be made for a University Center with the following features:

- A Center that cuts across and integrates different disciplinary concepts, methods and approaches;
- A Center that is tied to applications, and to fostering innovation and entrepreneurship in a polytechnic, learn-by-doing context;
- A Center that bridges epistemological boundaries between business, engineering, the social sciences, the humanities and the physical and natural sciences.

We also believe that Cal Poly is the logical parent for such an organization as the proposed University Center for Innovation and Entrepreneurship, for the following reasons:

- Cal Poly today has a critical mass of faculty, staff and business partners actively involved in technological innovation and entrepreneurship;
- Cal Poly is evolving a culture of entrepreneurship that focuses industrial partnerships on new ventures;
- Cal Poly is increasingly involved in community partnerships trying to foster an entrepreneurial, technology-based regional economy;
- As a polytechnic university, innovation is at the core of what Cal Poly does and is.

How Would a University Center for Innovation and Entrepreneurship Work?

Four issues are particularly pertinent to answering this question: vision and mission; structure; leadership; and funding.

Vision and Mission. The vision is to create a nationally recognized education, research, action and advocacy center concerned with the processes, structures and outcomes of entrepreneurship and innovation. The mission is to educate more students more intensively in these areas, foster research in entrepreneurship and innovation and enable the practice of entrepreneurship in our campus and regional community.

Structure and Leadership. The Center would function as an R&D and outreach entity, with a modest amount of core "hard money" support (ideally in the form of endowment) that would also be highly leveraged in terms of external grants and contracts. A small leadership cohort would receive guidance from a Center Advisory Board, with members from campus, regional and national organizations. Many of the members of this Board can be drawn from the list of interested parties in Appendix A. Researchers and practitioners from across the country would be invited to be affiliated Scholars, and
partner with Cal Poly-based faculty. The primary unit of activity would be the Project, all of which would be externally funded and most of which would involve collaboration between faculty from various units and institutions on campus, as well as partnerships from regional and national entities.

It is recommended that intellectual and scientific leadership (Director) of the Center during a two-year launch period be shared between Dr. Louis Tornatzky and Dr. Jonathan York (working initially on a partial released time basis). Since Dr. Tornatzky and Dr. York are both tenure track faculty members in the College of Business, with leadership responsibilities in the Entrepreneurship Concentration therein, there will be a natural and enduring linkage to the College of Business. In addition, a staff Administrator will be folded into Center operations, starting initially on a part-time basis. It should be emphasized however, that the Center can only accomplish its vision and mission if it is seen, and is in fact, an organization that serves the entire campus as well as being seen as a community asset. In Appendix B, vitae have been provided for Drs. Tornatzky and York.

**Launch Funding.** As suggested above, the Center is visualized as eventually a predominantly soft money operation, supported by a variety of public and private "investors." Initially, a modest amount of launch resources, in cash or in kind, for the first two years of operation will need to be secured, probably in the range of $25-100K per year. This could be raised privately through grants and/or individual supporters, with a small amount of initial University funding through the Orfalea College of Business and the Office of Research and Graduate Programs. It would be reasonable to expect that within 6-9 months a number of proposals would be under review by federal funding agencies, foundations and private donors. If funded, and of sufficient magnitude, there would be eventual IDC recovery that would accrue to the Center.

In the longer term, a stable source of endowment-based funding would be desirable to support the ongoing administrative functions of the Center, as well as to kick-start and match-fund Center Activities (see below).

We expect to reach a goal of steady-state level of funding in the range of $250-500K per year from a variety of sources within 2-3 years after official launch. A more detailed depiction of future funding expectations is presented in Appendix D. Both of the founding leaders of this center have an established track record in securing financing such as this. Over his career, Dr. Tornatzky has secured well over $10 million in external research funding from various agencies and foundations. In his previous positions, Dr. York has raised over $150 million in public and private funds for business, civic, and academic projects.

**Illustrative Activities and Projects**

The work of the Center is expected to be quite diverse and will include research and "action" projects, with one-time events alongside multi-year work, which will be
attractive to a wide variety of potential “investors.” The following are the best opportunities for building a portfolio of sponsored projects and activities:

**Research Studies of Innovation and Entrepreneurial Processes.** Despite a relatively rich body of research, across a range of disciplines, there are still a number of important questions about innovation and entrepreneurial processes, that have been a difficult challenge for academic institutions. Simply put, the phenomena do not fit well with the typical structures and processes of the academic world, nor do they match well with the disciplinary structure of universities. For example, one of the most complete integrative reviews\(^8\) of the conceptual and empirical literature on innovation argued the following:

- Entrepreneurship and innovation are not discrete events, but processes that encompass many events and many explanatory factors that cut across disciplinary boundaries;
- Entrepreneurship and innovation are longitudinal processes, often taking years, and the events and explanatory factors are qualitatively distinct depending on where one is in the overall process;
- Entrepreneurship and innovation processes occur at different levels, often simultaneously, that in turn do not correspond to the conceptual domains and preferred methodologies of academic disciplines or sub-disciplines.

This state of the field suggests that there is an opportunity to focus Cal Poly’s research assets, through the enabling role of the Center, on topics that have conceptual and practical value. For example, these include: the cultural underpinnings of university technology transfer; organizational and inter-organizational structures facilitating technological innovation; risk-taking and innovation; and the regional economics of entrepreneurship. Studies of this nature are likely to be funded by the discipline-based programs of NSF or similar agencies, or larger national foundations. The Center will emphasize interdisciplinary projects relating to both innovation and entrepreneurship.

**Projects Fostering Campus and Community Entrepreneurship and Innovation.** There is now a rich experience base of activities that can foster student and community interest and involvement in entrepreneurship. In the past year, the pace of entrepreneurship activities on campus has quickened. Among these have been:

- Drs. Christy and Tornatzky hosted an Entrepreneurship Forum at Cal Poly in the fall of 2008 that brought together faculty from across the campus, community business and technology leaders, and venture capitalists to highlight entrepreneurial progress at the University;
- Dr. Susan Opava, Dean of Research and Graduate Programs, has been sponsoring a quarterly forum focused on technology transfer activities and recent innovations by Cal Poly faculty. These events have been well attended by CEOs and Chief Technology/Engineering Officers from high-tech companies in the region as well as Cal Poly faculty researchers;

• Dr. Opava sponsored an extended visit this past year by Dr. Ken Walters and Dr. Alvin Kwiram, who met with many groups across campus to share their experience in a variety of areas related to entrepreneurship and technology commercialization at the University of Washington;

• Innovation activity among faculty has increased dramatically in recent years, resulting in a steady stream of invention disclosures to the Office of Research and Graduate Programs and a concomitant increase in the filing of patent applications and issuance of patents;

• Both the Ray Scherr Business Plan Competition and Innovation Quest have seen an increase in the quality of the applicants and the leaders of Innovation Quest have planned a summer activity to provide more business development support to this year’s winners;

• Drs. York and Tornatzky have been meeting regularly with faculty in the College of Engineering across most of their disciplines to seek avenues for collaboration in entrepreneurship activities;

• Dr. York and a group of students have re-started the Entrepreneurship Club, Cal Poly Entrepreneurs which will commence a full range of activities in the Fall of 2009. A fall kickoff meeting was held in the Entrepreneurial Ideation Lab (EIL) and drew 35 students from 4 colleges;

• The Cal Poly Office of University Housing, Department of Apartment Life and Education, has designated an “Entrepreneurship Learning Center” at Poly Canyon Village. Drs. York and Tornatzky are assisting in the launch of this program for the 09-10 academic year;

• Conversations are well along with the Dean of Libraries to co-host, at the library, entrepreneurship related events, perhaps modeled after the MIT Enterprise Forum;

• The marketing faculty in the Orfalea College of Business have focused their curriculum on innovation and in project-based courses supporting startups and new business opportunities.

There is also an opportunity to foster general awareness and knowledge among faculty members about technology transfer policies and procedures – particularly with an eye to startups – by conducting short seminars at targeted disciplines and individuals. Tornatzky has been involved in such work in the past.

_Fostering Venture Incubation._ In the past, and still at this point in time, the “deal flow” of potential entrepreneurial ventures coming out of the Cal Poly community – faculty, students and staff – has been quite modest. Nonetheless, it is increasing (as noted above) as is a perceived need for some kind of technology commercialization and business support services. The Dean of Research and Graduate Programs, Dr. Susan Opava, and Jim Dunning, Project Administrator for C3RP, have been working on this problem and the University Center for Innovation and Entrepreneurship would be an asset to those efforts, particularly given the past experiences of the initial Center leadership.
While a fully functioning incubator facility may not yet be justified, there is an opportunity and need to develop a transitional structure providing such services. This could be achieved by the establishment of non-residential “virtual” incubation services, in partnership with local experienced entrepreneurs. In addition, with the Cal Poly Technology Park coming on line within the next 15 months, this could provide another venue for time-limited virtual and physical incubation activities. A plan is being considered for a small incubation space in the building funded through sponsorships. Dr. Tornatzky serves on the Academic Advisory Committee for the Technology Park project, and Dr. York serves on the San Luis Obispo Chamber's Economic Development Collaboration Committee as one of Cal Poly’s representatives, along with Provost Koob, Susan Opava and Jim Dunning.

**Evaluation and Benchmarking Studies of Innovation and Entrepreneurship Outcomes.**
While understanding innovation and entrepreneurial processes is the intellectual thread that ties this body of work together, often progress toward this goal can be reached via work that is primarily looking at outcomes. For example, under Dr. Tornatzky’s direction, the Southern Technology Council executed a 10-year program of “benchmarking” research that examined technology transfer outcomes across research universities in the South. There is a great need to expand and update work such as this and develop a more comprehensive set of metrics, tools and analytic methods. Currently, Dr. Tornatzky and Dr. York are in the early stages of a national study of long-term outcomes of regional entrepreneurial public-private initiatives. Also, Drs. Tornatzky and York, along with Dr. Lynn Metcalf and Dr. Stern Neill, have submitted to the National Science Foundation a research proposal on “marooned assets” in innovation and technology, which will examine university-community technology collaboration in smaller university communities that are geographically isolated.

**Culture-Changing Events and Activities.** Historically, the exposure of the Cal Poly community to entrepreneurship and entrepreneurs has been limited and hit-or-miss. As a result, student and faculty interest and involvement has been much less than at other campuses. Similarly, at campuses that are active and successful in fostering technology-based ventures, there is lore, a set of stories and cultural values that encourages entrepreneurship among faculty and students. In order to accelerate the visibility and actual deal flow of entrepreneurial ventures, an awareness and culture building process needs to be undertaken, in which the Center will play a role and which will involve both students and faculty, as well as the broader entrepreneurial community. These could include: an entrepreneurship mentoring series; organizing entrepreneurship events such as “fairs”; accelerating the scope and prominence of the business plan competition; organizing field trips to entrepreneurship events (e.g., Tornatzky has been leading student attendance at events hosted by the MIT Enterprise Forum based in Santa Barbara); facilitating exposure to entrepreneurship enabling organizations (e.g., Plug and Play Tech Center) and encouraging participation in entrepreneurship activities on campus that bridge disciplines and colleges. All of these events and activities have cumulative impacts that tend to “tip” the culture. The goal would be that within the foreseeable future the student and faculty culture at Cal Poly regarding entrepreneurship would look more like a Stanford or MIT than it does now.
Vetting the Center Concept

At the suggestion of Drs. Christy, Opava and Koob, conversations have been conducted with a range of on-campus and community stakeholders to discuss the concepts behind this proposal and potential action items. We have identified and talked with faculty members, administrators and staff who have substantive interests in entrepreneurship and innovation, who might want to affiliate with such a Center, and who would be willing to be involved in further planning and fund raising. A parallel process was also undertaken in the community – identifying and enlisting private sector parties including venture investors, technology entrepreneurs and economic development officials.

The outcomes of that process have been positive and substantive, and this version of the Center Proposal reflects many suggestions that we received. Nonetheless, the question of whether Cal Poly should play a larger role in entrepreneurship and innovation education, scholarship and practice seemed to be a “no-brainer” for the admittedly biased sample of informants. Their message was: do it; do it now; and do it as big as current and future resources permit.