

Adopted: March 2, 2004

ACADEMIC SENATE
of
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
San Luis Obispo, CA

AS-611-04

RESOLUTION ON
PROPOSAL FOR THE ESTABLISHMENT OF THE
UNIVERSITY CENTER FOR EXCELLENCE IN
SCIENCE AND MATHEMATICS EDUCATION

- 1 WHEREAS, California's continued economic vitality depends upon its ability to develop and apply
2 scientific and technological innovations; and
3
- 4 WHEREAS, Rates of high school and college program completion in California, particularly in science,
5 technology, engineering, and mathematics (STEM) disciplines, lag behind those of many
6 other states; and
7
- 8 WHEREAS, Early exposure to and success in science and mathematics is key to successful
9 participation in STEM disciplines and careers; and
10
- 11 WHEREAS, Competent, inspired K-12 science and mathematics teaching is perhaps the single most
12 important variable influencing student participation and success in STEM disciplines, but
13 a significant percentage of California's K-12 science and mathematics teachers are not well
14 qualified; and
15
- 16 WHEREAS, The CCST (California Council on Science and Technology) Critical Path Analysis, and
17 national initiatives, such as the Business Higher Education Forum, are advocating greater
18 attention to K-12 students' early preparation in science and mathematics; and
19
- 20 WHEREAS, Cal Poly has long-established relationships and commitments to preparing new teachers,
21 providing professional development to in-service teachers, and working with K-12
22 students in the science and mathematics disciplines; therefore, be it
23
- 24 RESOLVED: That the Academic Senate endorse the *Proposal to Establish the University Center for*
25 *Excellence in Science and Mathematics Education.*

Proposed by: Philip Bailey, Robert Detweiler, Bonnie Konopak,
and Susan Opava
Date: November 14, 2003
Revised: January 12, 2004
Revised: January 30, 2004
Revised: March 2, 2004

Proposal to Establish the University Center for Excellence in Science and Mathematics Education

Background and purpose:

California and the nation have a critical need for an effective educational system that produces the scientists and engineers that are essential to our economy.

- California's continued economic vitality depends upon its ability to develop and apply scientific and technological innovations.
- Among the state's new, increasingly diverse generation of students, however, rates of high school and college program completion, particularly in science, technology, engineering, and mathematics (STEM) disciplines, lag behind many other states. (See, for example, the California Council for Science and Technology's 2002 "Critical Path Analysis of California's Science and Technology Education System.")
- Early exposure to and success in science and mathematics is key to successful participation in STEM disciplines and careers.
- Competent, inspired K-12 science and mathematics teaching is perhaps the single most important variable influencing student participation and success in STEM disciplines, but a significant percentage of California K-12 science and mathematics teachers are not well qualified.

Cal Poly, through the strength of its academic programs, makes an important contribution as one of the nation's leading educators of high-quality polytechnic graduates. Cal Poly also recognizes the need to strengthen the quality of science and mathematics education in California's K-12 schools in order to help ensure that California students are prepared to pursue further study leading to careers in science and technology fields. Through its support for the CCST Critical Path Analysis and initiatives at the national level, including an emerging Business Higher Education Forum K-12 science and mathematics initiative, Cal Poly has advocated greater attention to the early preparation in science and mathematics of the nation's diverse student population. Cal Poly's Centennial Celebration, the Inaugural Baker Forum and the ongoing deliberations of the President's Cabinet all have given a place of prominence to this issue.

At the April 2003 Plenary Session of the Cal Poly President's Cabinet, the Cabinet urged Cal Poly to strengthen and expand its direct efforts to support K-12 science and mathematics education and in particular its efforts to prepare and support K-12 science and mathematics teachers. On behalf of the University, President Baker accepted that challenge. The University Center for Excellence in Science and Mathematics Education is dedicated to that purpose.

Mission:

The Center's mission is to build upon and strengthen cooperative relationships with K-12 schools and private industry in order to pursue three important purposes:

1. promote and support high quality teaching of science and mathematics in K-12 schools;
2. produce more well-qualified K-12 teachers with special strengths in science and mathematics education; and
3. encourage K-12 school students to study science and math so they can enter “pathways” leading to careers in science, technology, engineering, and mathematics.

Goals:

The specific goals of the Center include the following:

- Promote and support Cal Poly’s K-12 science and mathematics teacher education programs.
- Support K-12 science and mathematics teachers so they are able to remain professionally current, to be more effective with their students, and to be retained in the teaching profession.
- Encourage private industry to support K-12 science and mathematics teachers, students, and programs.
- Encourage K-12 students to study science, technology, engineering and mathematics (STEM) disciplines and pursue careers in STEM fields.
- Serve as a repository of information on “best practices” in K-12 science and mathematics education.
- Assess the quality of science and mathematics educational programs.
- Influence public policy regarding excellence in science and mathematics education.

Proposed short-term-objectives:

- (1) Expand Cal Poly’s K-12 science and mathematics teacher education program in order to increase the number of graduates per year to 50.
- (2) Support the outreach efforts of the admissions staff and expand “targeted” recruitment in order to ensure the quality and diversity of students in Cal Poly’s K-12 science and mathematics teacher education programs (elementary and secondary levels).
 - Expand on targeted recruitment in the Liberal Studies program.
 - Identify specific ways to recruit good students for the single subject (secondary school) credential program in science and mathematics.
- (3) Collect information on “best practices” in science and mathematics education from existing programs throughout the nation, and provide assessment and evaluation of Cal Poly programs in these areas.
- (4) Solicit financial support from corporations and individuals to provide scholarships for science and mathematics education students at Cal Poly with an initial goal of scholarship support for 10 students.

- (5) Seek grants and corporate support to help fund the following needs of the Center:
 - Support for the operation of the Center.
 - Support for building stronger relationships with “partner” schools.
 - Scholarships for “partner” school graduates who go into science and mathematics education programs at Cal Poly.
 - Support for science and mathematics teachers in selected schools who would like to help recruit K-12 students into the science and mathematics “pathway.”
 - A part-time grant writer to assist with specific grant applications.
- (6) Establish a Cal Poly website to aid and support K-12 science and mathematics teachers through dissemination of information on curricular innovations, pedagogy, learning assessment, etc.
- (7) Form an advisory group of K-12 science and mathematics teachers to help guide the work of Cal Poly and the Center.
- (8) Host K-12 science and mathematics teachers annually at Cal Poly to review their needs, to consider ways to strengthen STEM pathways, and to identify ways to improve teacher retention.
- (9) Form a corporate advisory group to provide advice and to assist with targeted fund raising that will help accomplish the goals of the University and Center.

Proposed longer-term objectives:

- (1) Provide a summer institute to enhance the competency and teaching skills of K-12 science and mathematics teachers.
- (2) Provide on-line instruction to support K-12 science and mathematics teachers.
- (3) Provide professional development and support for science and mathematics teachers at “partner” schools
- (4) Provide corporate internships or summer employment for K-12 science and mathematics teachers to encourage and support their interest in remaining in the teaching profession.
- (5) Establish a school-within-a school in a selected K-12 district or districts to direct elementary and secondary school students into careers as science and mathematics teachers (future teacher academy concept).
- (6) Organize Cal Poly administrators, faculty, and students to work with K-12 representatives and corporate leaders to influence public policy concerning K-12 science and mathematics teaching and educational “pathways.”
- (7) Expand the teacher-in-residence program.
- (8) Explore ways to recruit targeted retirees into K-12 science math teaching as a “second career.”
- (9) Explore ways to expand “blended” programs for K-12 science and mathematics teacher education students.
- (10) Form a “Future Science and Mathematics Teachers Club” at one or more targeted K-12 schools.
- (11) Provide a mobile wet lab to aid K-6 teachers introduce students to and excite their interest in discovery.

Need for a new organizational structure:

The Center is intended to work within the present Cal Poly organizational structure (particularly the College of Science and Mathematics, the University Center for Teacher Education, and the College of Liberal Arts) to focus on expanding the University's commitment in the area of K-12 science and mathematics education. It will not alter the current academic structure, but will draw upon and support key faculty and staff within that structure as they seek to achieve the goals outlined above. In brief, the Center will attempt to stimulate and coordinate efforts by faculty and staff from diverse Cal Poly units, from K-12 schools, and from industry. It will seek resources and provide encouragement to faculty and staff who are committed to enhancing K-12 science and mathematics teaching. The Center is needed to help Cal Poly achieve a substantial expansion of its involvement with K-12 science and mathematics education and promotion of pathways to careers in science and technology for K-12 students.

Relationship to the instructional program:

The Center is intended to support and assist Cal Poly instructional programs, particularly the science and mathematics teacher preparation programs and master's degree programs in the College of Science and Mathematics, the Liberal Studies Program in the College of Liberal Arts, and the University Center for Teacher Education. It will draw upon faculty and staff from these Cal Poly instructional programs to serve on the Center Advisory Council, and it will remain in close communication with these programs and support them. The Center will not provide instructional programs independent of existing academic entities, yet its work will help foster a broader awareness of science and technology issues and "literacy."

Founding members and their expertise:

Provost Paul Zingg has taken the lead in forming the Center. He formed a steering committee to initiate the Center's structure, goals, and objectives; this group includes Dean Philip Bailey of the College of Science and Mathematics, Dean Bonnie Konopak of the University Center for Teacher Education, Dean Harry Hellenbrand of the College of Liberal Arts, and Dan Howard-Greene and Robert Detweiler from the President's office. The Center will draw upon the expertise of Cal Poly faculty and staff who work with K-12 science and mathematics education, local K-12 teachers and administrators, and representatives from industry.

Effect of the unit on academic departments:

The Center will seek to support faculty and staff who are committed to K-12 science and mathematics education. It will foster growth of their academic programs, seek grants and contributions to assist their enterprises, and provide a means for communication and cooperation.

This unit will serve as an advocate for and aid to Cal Poly faculty and staff who are working to graduate more K-12 science and mathematics teachers; it will seek to aid K-12 teachers who are currently in the field; and it will support activities that encourage K-12 students to pursue careers in science and technology.

Organizational structure of the unit:

The Center will report to the Provost. It will be guided by a Center director and a Board of Directors. Board members and the Board Chair shall be appointed by the University President and shall include:

- Provost
- Dean, College of Science and Mathematics
- Dean, College of Liberal Arts
- Dean, University Center for Teacher Education
- One (1) representative from the Center's corporate advisory group
- Five (5) representatives from K-12 education, at least three of whom will be science or mathematics teachers
- Two (2) community college faculty, with representatives from Cuesta College and Hancock College
- Five (5) Cal Poly faculty, with representatives from the College of Liberal Arts, College of Science and Mathematics, the University Center for Teacher Education; and one (1) Cal Poly faculty member from the College of Engineering
- Two (2) Cal Poly science and mathematics education students
- One (1) representative from University Advancement
- Executive Assistant to the President

The Director of the Center will organize Board meetings and support the Board Chair in convening the Board. Board meetings will take place at least once each quarter during the regular academic year, or more often as needed.

Bylaws and more formal operating procedures will be developed by the Center Director and Board.

Fiscal and administrative support and facilities:

The Center will not be allocated state funding for its operations. Rather it will draw on existing Cal Poly staff and volunteer Advisory Board members for support and seek outside funding for its activities.

Dr. Philip Bailey, Dean of the College of Science and Mathematics, and Dr. Bonnie Konopak, Dean of the University Center for Teacher Education, are serving as the Center's founding co-directors and will meet the Center's initial day-to-day administrative support requirements through the existing resources of their respective offices.

The Center will seek grants and donations to help faculty and staff achieve Cal Poly's goals of enhancing K-12 science and mathematics education, particularly those involving K-12 teachers and students directly.

The Center itself will require minimal funds to operate, inasmuch as it draws upon existing staff and resources. On the other hand, it will cost a substantial amount to expand Cal Poly's teacher education programs, to support K-12 teachers, and to encourage K-12 students to study science and technology. The rate of achieving these objectives will depend on expansion of State support, winning grants and donations, and engaging corporate and other partners.

The Center is not dependent on outside sources of funding for its modest initial operation. If it uses grants or donations to expand operations, however, and later those sources are no longer available then the Center must be pared back. The purpose of the Center is to aid existing academic programs to expand their work in K-12 science and mathematics education; it will not drain resources from academic units or programs.

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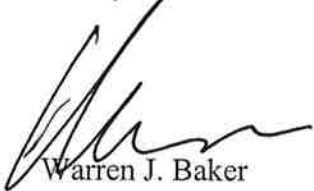
CAL POLY

SAN LUIS OBISPO
CA 93407

State of California
Memorandum

To: George Lewis
Chair, Academic Senate

Date: March 10, 2004

From: 
Warren J. Baker
President

Copies: R. Detweiler, P. Bailey,
B. Konopak, S. Opava

Subject: Response to Academic Senate Resolution AS-611-04
Resolution on Proposal for the Establishment of the University Center for Excellence in
Science and Mathematics Education

I am pleased to approve the above-subject Resolution endorsing the establishment of the University Center for Excellence in Science and Mathematics Education. The proposed center also received the endorsement of the Academic Deans' Council at its meeting on March 8. Based on these positive endorsements, I have approved of the establishment of the University Center for Excellence in Science and Mathematics Education, effective immediately. A copy of the correspondence establishing the Center is attached.

Please express my appreciation to the Academic Senate for their work in this regard as well as my thanks to Deans Bailey, Konopak, and Opava for their excellent work in the development of this Center.

Attachment