

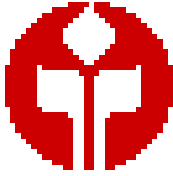


Recruitment and Retention of Under- Represented Students

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Proposal for the

Recruitment and Retention of Under-Represented Students

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INTRODUCTION

Throughout the College of Engineering, Computer Science and Technology (ECT) on the Chico campus of the California State University the recruitment and retention of under-represented students is a challenge that has not been resolved. Albeit the establishment of the Mathematics, Engineering, and Science Achievement (MESA) program has accommodated recruitment efforts of economically disadvantaged individuals (specifically those of traditionally under-represented ethnic groups) in high schools and even junior high schools throughout the North State, retention efforts have been sporadic and need to be addressed. Within ECT African American, Hispanic, and Native American enrollments reflect neither relative populations throughout the state nor those of the catchment region this campus serves.

In order to remedy the situation an ad hoc Committee on Recruitment and Retention of Students from Under-Represented Groups, including minorities and women, was established this past summer within the Department of Computer Science. The first project, launched at the outset of the fall semester, focused on establishing a women's network. Because nascent women's groups exist within the College, as well as earlier attempts that have waned, the Committee's intention was to "get the ball rolling" by reactivating and revitalizing efforts already underway, but currently under-supported. The next focus of the ad hoc Committee is to pull together similar, frequently disparate, activities and groups within ECT that attempt to support the special needs of students from various traditionally under-represented ethnic backgrounds, particularly the three listed above. The first objective is to foster an atmosphere within the College and across the campus of appreciation for cultural diversity. Some of the ways in which the Committee plans to do this include:

- Creating and maintaining a monthly program of speakers (within the College, across the campus, and at the community level) who will speak to the issues of technology. It is the intent of the Committee to invite speakers who are well-known within some context of technological achievement and who happen to be members of groups under-represented in that area.
- Increasing the recruitment efforts of ECT, particularly at community colleges, throughout the North State, and eventually throughout California focusing on students traditionally under-represented on this campus within technical fields. Wherever possible recruitment will be conducted by members of under-represented groups.

- Designing and maintaining a web site that encompasses various salient issues for under-represented students and maintains links to all programs and other sites of pertinent interest.
- Acquiring computer equipment that can be assigned to under-represented students on a revolving loan program, enabling successful study at home as well as within the computer laboratories housed in the O'Connell Technology Center.
- Establishing a private scholarship fund in the donor's name specifically to provide under-represented students with potential access to CSU Chico's College of ECT and to enable those with promise to complete their degree goals.
- Securing funding to provide resources and stipends for Graduate Research Projects especially earmarked for under-represented graduate students within ECT.
- Establishing travel funds for under-represented students already enrolled in the College to attend regional or national conferences within these fields.
- Enhancing local Internship and Cooperative placements to ensure that more under-represented students gain access to these experiences.

NEEDS STATEMENT

The purpose of this proposal is to address issues of under-representation within the College of Engineering, Computer Science, and Technology (ECT) of the California State University in Chico, CA. Under-representation of minorities, particularly of African Americans, is evident at multiple levels: from the classroom, within departments of the College of ECT, in the College itself, indeed, throughout the University and the whole community. Under-representation is also evident when we attend out-of-town conferences and workshops for the disciplines and majors offered by the College of ECT. To facilitate the evolution of a diverse, multi-culturally friendly environment -- from the classrooms to the community -- this proposal focuses primarily on addressing the issue within the College of ECT with the hope of having an impact on the University and in the community as well.

Although data indicate that the population distribution of minorities has increased from 43% in 1990 to 48% in 1997 for the State of California (see Table 1), this is not reflected locally. In Butte County, for example, minority distribution increased from 13% to 15% between 1990 and 1997 (see Table 2). CSU - Chico's Office of Institutional Research reports that in the fall of 1998, the University's minority student population was 17% (see Table 3). Although we do not have the records for the College of

ECT at this time, of the 17% minorities on campus less than 2% are African American. Further, it is estimated that far fewer than 1% of ECT students are African American. This is a dismal figure. The entire minority population of CSU-Chico is alarmingly low as compared to the state population. Moreover, this is compounded by the long-standing national phenomenon within the computer science and engineering disciplines where enrollment and success of underrepresented students is significantly lower than most other academic disciplines.

Diversity tends to be one of the major facets of a truly progressive University. California State University - Chico has its own set of offerings that are meant to attract people from various cultures into the beautiful and engaging physical environment that characterizes Chico. Some of these include:

CSUC Ethnic and Cultural Student Organizations

Africa Club

American Indian Club

Black Student Alliance

Chinese Student Association

Filipino-American Student Assoc.

General Union of Palestine Students

Hmong Students Association

Indian Student Association

Indigenous Nations Alliance

Vietnamese Student Association

Japan-Chico Club

Laos Student Association

Malaysian Student Association

Movimiento Estudiantal Chicano de Aztlan

Pan Arab Student Union

Russian Club

Sinorama Society - Chinese Student Assoc.

Student Diversity Committee

Turkish Student Club

Activities and Special Programs

Multicultural Night

Multicultural and Gender Studies program (BA)

Minors in:

African American Studies

American Indian Studies

Asian American Studies

Chicano Studies

Managing Diversity in Organizations

Multicultural Studies

Women's Studies

The university also houses the Mathematics, Engineering, and Science Achievement (MESA) program the Chancellor's Alliance for Minority Participation (AMP). These programs address specific needs of minority students within the larger framework of the university as a whole. These programs focus on priorities such as acquiring scholarships, funding housing, mentoring, etc. Although relative growth in a subset of the minority population across campus has been demonstrated, actual enrollment of African Americans has **declined** by 10% over the 1994-1998 period. Additional involvement is needed by the

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College, its constituent departments, faculty, staff, and the community if we are to turn this appalling trend around and effectively increase representation of such groups.

Table 1 - State of California population distribution from 1990 to 1997¹

	July 1990		July 1997		Population Growth within each group		% of all growth
White	17,132,047	(57%)	17,216,467	(52%)	84,420	(0.5%)	(3%)
Hispanic	7,775,189	(26%)	9,639,540	(29%)	1,864,351	(24%)	(62%)
Asian/Pacific Islander	2,746,190	(9%)	3,589,985	(11%)	843,795	(31%)	(28%)
African American	2,105,282	(7%)	2,315,209	(7%)	209,927	(10%)	(7%)
Native American	185,121	(1%)	195,759	(1%)	10,638	(6%)	(0%)
Total	29,943,829		32,956,960		3,013,131		

Table 2 - Butte County, (CA) population distribution from 1990 to 1997¹

	July 1990		July 1997		Population Growth within each group		% of all growth
White	159,082	(87%)	168,662	(85%)	9,580	(6%)	(62%)
Hispanic	13,749	(8%)	16,671	(8%)	2,922	(21%)	(19%)
Asian/Pacific Islander	5,061	(3%)	7,309	(4%)	2,248	(44%)	(15%)
African American	2,256	(1%)	2,579	(1%)	323	(14%)	(2%)
Native American	2,963	(2%)	3,284	(2%)	321	(11%)	(2%)
Total	183,111		198,505		15,394		

Table 3 - CSUC facts (Fall 1998)²

	Fall 1994		July 1998		Population Growth within each group		% of all growth
White	10,494	(74%)	10,099	(67%)	-395	(-4%)	(-53%)
Hispanic	1,192	(8%)	1,402	(9%)	210	(18%)	(28%)
Asian/Pacific Islander	671	(5%)	665	(4%)	-6	(-1%)	(-1%)
African American	340	(2%)	306	(2%)	-34	(-10%)	(-5%)
Native American	239	(2%)	260	(2%)	21	(9%)	(3%)
Other/Undeclared	1296	(9%)	2250	(15%)	954	(74%)	(127%)
Total	14,232		14,983		751		

¹ DATA: from Department of Finance, State of California www.dof.ca.gov

² DATA: from CSU-Chico, Office of Institutional Research, www.safari.csuchico.edu

GOALS AND OBJECTIVES

The ultimate goal of the project described herein is to create an environment that will lead to increased recruitment and retention of qualified minority or otherwise under-represented student populations within the College of Engineering, Computer Science and Technology. We intend to accomplish this goal by focusing on the overall educational experience provided to these students, by California State University - Chico, specifically within the College of Engineering, Computer Science and Technology. It is anticipated that the activities and events supported by this project will both directly and indirectly lead to positive experiences for under-represented students. Such positive experiences will be an obvious benefit for retention, as well as a catalyst for recruitment.

Objectives:

1. Increase the enrollment of under-represented groups within the discipline of Computer Science.
2. Increase the enrollment of under-represented groups within the discipline of Computer Information Systems.
3. Increase the enrollment of under-represented groups within the Computer Science Graduate Studies program.
4. Increase the enrollment of under-represented groups within the College of ECT.
5. Increase the graduation rate of under-represented groups within the discipline of Computer Science.
6. Increase the graduation rate of under-represented groups within the discipline of Computer Information Systems.
7. Increase the graduation rate of under-represented groups within the Computer Science Graduate Studies program.
8. Increase the graduation rate of under-represented groups within the College of ECT.

The success of the proposed project will be measured by analyzing CSU-Chico College of ECT recruitment and retention trends over the duration of the project, and beyond. Population statistics on enrollment and graduation will be compared to trends from previous years.

APPROACH / METHODOLOGY

General Approach:

The proposed project will address the challenge of the recruitment and retention of under-represented students at several levels. Our program will focus on creating an awareness of the intellectual talents and capacities of under-represented groups within the Engineering and Computer Science disciplines.

Target audiences for generating sensitivity include the College of ECT, the University, and the Chico community. The primary venue for creating awareness will be through a distinguished speaker series. At yet another level, the program will address the needs of the under-represented students directly, by providing inspiration, encouragement, assistance, and enhanced opportunities for learning and networking within their discipline.

Activities Proposed:

➤ Distinguished Speaker Series

High profile and respected speakers from groups traditionally under-represented in the disciplines of Computer Science and Engineering will be invited to the CSU-Chico campus, as contributors to the Distinguished Speaker Series. These speakers may be selected from any one or more of the following candidate pools:

- Computer Science, Information Science, Technology, or Engineering scholars or scientists from scholarly institutions or national laboratories.
- Computer Science, Information Science, Technology, or Engineering professionals from within the industry.
- High-profile figures and national leaders.
- CSU-Chico faculty, staff, students, and community leaders.
- CSU-Chico alumni.

Efforts will be made to collaborate with other offices/departments on campus to share in the expense of bringing very high profile speakers to campus. On average, we will attempt to bring in twelve speakers per academic year: six at the college level, four at the institutional level, and two at the community level. Included in the speaker series will be the opportunity for students to meet with the speaker(s) in a social environment, where provision of light refreshments will encourage casual conversation.

➤ Recruitment – off-site presentations & orientations

The four co-investigators will design and implement recruitment presentation(s) to be presented to middle schools and high schools around the state and neighboring communities. We will specifically include those schools having large minority populations. Recruitment activities will begin immediately, and be strongest in the fall semesters. Spring recruitment will include travel to nearby junior colleges and preparation for summer orientation programs for our recruits. Some of the resources required for recruitment include videotapes, presentation media, T-shirts, flyers, telephone charges, travel, and hotel accommodations.

➤ Web page development & maintenance

A part-time programming position will assist in the design and maintenance of a project web page. From this site, students will be able to access links that address the specific needs and interests of minority and under-represented groups within the disciplines. Information about the

program, its status, and success factors will be made available at this site. This position may be shared with other campus programs to support the position.

- **Computer Lending Program**

Partnerships will be sought with computing hardware vendors to establish a lending program of computer hardware for those students demonstrating need. The vendors will receive college and university recognition for their contributions to this program. Initially, seed money will be requested as a component of this proposal, to provide for a small amount of initial equipment, upgrades, and software.
- **Scholarship Program**

A private scholarship fund in the donor's name will be established, free of any legal constraints of the state because of its private nature, that will provide under-represented students with potential access to CSU Chico's College of ECT and to enable those with promise to complete their degree goals.
- **Funding for Graduate Research Projects**

Resources and stipends will be made available on a limited basis, for minorities and under-represented graduate students working on research projects with faculty, within the limitations of the law.
- **Student Travel**

Assistance and funding will be provided to send two (2) students per year to regional or national conferences within the disciplines of Computer Science and Engineering. Special attention will be placed on those conferences addressing the needs of minorities/under-represented groups. The students' travel, room, board, and conference fee will be funded at 100%. Support for this endeavor may be shared with other campus departments or programs.
- **Local Internship & Cooperative Placements**

Internships and Cooperative Placements will be sought through local companies within the Chico community and surrounding vicinity. To entice the community we will share in the cost of the student salaries by providing matching funds. This program is essential to the project because it creates a bridge between our target student population and the Chico community.

OUTCOMES, BENEFITS, RESULTS

This program will expose all students in the College of Engineering, Computer Science and Technology to relevant role models and will foster retention of under-represented students in the program. The exposure to role models of outstanding under-represented individuals from the Computer Science and Engineering fields will help mold a positive attitude of 'acceptance' among students within the college. The exposure of the campus as a whole to such role models from all disciplines will provide

acknowledgement and means of empowerment. Likewise, such exposure will help foster 'acceptance' within the University. Finally, because the students' lives go beyond the walls of the University it is important to provide role models and exposure of under-represented individuals to the community as a whole. Again, such exposure will facilitate improved attitudes as well as providing means of empowerment throughout the community. Overall, both recruitment and retention will be enhanced by improving the environment within the College, across the campus, and within the community.

PROJECT DIRECTOR AND STAFF

Each of the four co-investigators of this proposal holds a doctorate and is a full-time tenure-track Assistant Professor in the Department of Computer Science at California State, University. Together, they have some 42 years of combined teaching experience at the University level, with educational experiences spanning 14 different universities with a variety of populations and University missions. Each of the four co-investigators holds a strong commitment toward increasing the enrollment of under-represented groups within the College of ECT.

Benjoe A. Juliano holds a Ph.D. in Computer Science from The Florida State University (1993), an MS in Computer Science from The Florida State University (1990), and a BS in Computer Science from the University of the Philippines at Los BaZos (1986). His teaching experience includes graduate and undergraduate courses in Computer Science at California State University - Chico, Coastal Carolina University, University of North Florida, The Florida State University, and the University of the Philippines at Los BaZos. Dr. Juliano is currently a co-investigator of a \$115,000+ grant to develop a DSP-based real-time power simulation tool. He was also awarded several grants at both CSU-Chico and Coastal Carolina University.

Patty Ratliff earned her Ph.D. in Educational Administration at the University of California, Berkeley in 1987. Before joining the Computer Science faculty at Chico State as lecturer in 1997 she had been Director of Training as well as lead instructor for twelve years for a Bay Area company providing UNIX training. In addition, Dr. Ratliff has been an Adjunct Professor for the San Jose-based National Hispanic University, a contract technical writer for Hewlett-Packard corporate, and Management Services Officer for the Engineering Systems Research Center at UC Berkeley. Currently she is Faculty Mentor for the Associated Students' Re-Entry Affairs Council and Faculty Sponsor for the Chico State Linux Users' Group.

Renee S. Renner received a Ph.D. in Computer Science from The Florida State University in 1999, an MS in Computer Science from Western Illinois University in 1993, and a B.F.A. from the University of Illinois in 1983. Her teaching experience includes graduate and undergraduate courses in Computer Science at California State University - Chico, Coastal Carolina University, The Florida State

University, and Western Illinois University. Dr. Renner has served as the director on several collaborative projects between students and non-profit agencies, including the *Boys and Girls Club* of Chico, and the *Grand Strand Community Against Rape* (GSCAR) Crisis Center in Myrtle Beach, SC. Dr. Renner has also experienced first hand the difficulties in being among the under-represented in the field of computer science. After ten years of graduate study as a female in a predominantly male discipline, she has emerged among the *success rate* statistics. The number of female Ph.D.s in CS each year is generally reported by the Computer Research Association to be in the low teens. An even rarer statistic would find very few women completing their doctoral studies while single parenting. Having dealt with such adversity in her own academic career, Dr. Renner is sensitive to obstacles which may overwhelm CSU - Chico ECT students as a result of under-representation coupled with a demanding major. Her passion and conviction for providing encouragement and guidance to these talented individuals will remain a driving force throughout her professional career and beyond.

Clarke Steinback received his Ph.D. in Computer Science at the University of California, Santa Cruz in 1999. Dr. Steinback's doctoral dissertation, *Computer Generated Finger Spelling for Assistive Technology*, relied heavily on input and participation of the deaf and hard-of-hearing community in developing and assessing prototypic translation devices and software. He teaches courses in programming and computer graphics in the Chico State Computer Science department. At Santa Cruz he taught introduction to programming and redesigned the introductory course in computer literacy, which is required of most majors on the campus -- some 750 students per year. Dr. Steinback is currently the Undergraduate Advisor for the Computer Science department as well as Faculty Sponsor for the Chico State chapter of the Association for Computer Machinery.

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BUDGET

Item	Breakdown	Estimated Annual Need	Anticipated Matching Funds ³	Amount Being Requested
Speakers	\$1500/event * 12/yr	\$18,000	\$6,000	\$12,000
Recruitment – off-site presentations/orientation	\$2000/fall + \$1000/spr + \$2000/summer	\$5,000	\$2,500	\$2,500
Web page development & maintenance	\$10/hr * 10hr/wk * 32wks	\$3,200	\$1,600	\$1,600
Computer Lending		\$10,000	\$8,000	\$2,000
Private Scholarship Fund	1 @ \$2,500/sem	\$5,000	—	\$5,000
Funding for Graduate Research Projects	\$10/hr * 10hr/wk * 32wks * 2 student scholars	\$6,400	—	\$6,400
Student Travel Stipends	\$1200/student * 2/yr	\$2,400	—	\$2,400
Local internships/coop. (matching funds)	\$10/hr * 20hrs/wk * 32	\$6,400	\$3,200	\$3,200
Faculty Summer Stipend (program coordination and orientation)	2@ ½ time → ≈10k each	\$20,000	\$5,000	\$15,000
Faculty Fall Stipend (recruitment and project management)	2@ ¼ time → ≈10k each	\$20,000	\$5,000	\$15,000
Faculty Spring Stipend (project management & planning)	1@ ¼ time → ≈10k each	\$10,000	\$5,000	\$5,000
Subtotal		\$106,400	\$36,300	\$70,100
	Requested project duration is 2 years	x 2	x 2	x 2
TOTAL		\$212,800	\$72,600	\$140,200

³ Matching Funds for various components of this proposal will be pursued from such entities as: local businesses and industry in the North State, MESA, College of ECT, Department of Computer Science, the Graduate Studies Program, University Public Affairs, the Office of the Provost, Sponsored Programs, and the Chancellor's Alliance for Minority Participation.