RETHINKING GRADUATE EDUCATION IN THE CSU: MEETING THE NEEDS OF THE PEOPLE OF CALIFORNIA FOR GRADUATE EDUCATION FOR THE 21ST CENTURY

REPORT OF THE

TASK FORCE
ON
GRADUATE AND POSTBACCALAUREATE EDUCATION
IN THE
CSU

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PREFACE

In May 2001, the Academic Senate of the CSU passed Resolution AS-2534-01 reaffirming its support for the recommendations contained in the 1989 study of graduate education in the CSU, chaired by Gene Dinielli (Advisory Committee to Study Graduate Education in the CSU, 1989). The resolution also called for a Senate Task Force to examine the implementation of earlier recommendations, update those recommendations, and develop new recommendations based on the current context.

For the past several years since the adoption of the *Cornerstones* plan, the CSU has unsuccessfully sought funding from the Legislature for a "graduate differential" to assure more appropriate funding for graduate education in the CSU. The faculty remains strongly committed to recognizing the need for a "graduate differential" and the importance of documenting the case for the needed funding.

The Legislature's recently completed review of the Master Plan for Higher Education was a second stimulus for the resolution. Senator Dede Alpert, Chair of the Joint Committee for Developing a Master Plan for Education, had requested Academic Senate participation in identifying the needs and priorities for higher education in California. The CSU Academic Senate's review of the Master Plan Committee's questions affirmed the concern for funding levels (see the Academic Senate's report, *The CSU at the Beginning of the 21st Century: Meeting the Needs of the People of California;* Cherny, 2001), but also stimulated interest in exploring an expanded role for the CSU in doctoral education.

An increasingly urgent discussion in the legislature and higher education community has focused on the need for more educational administrators whose preparation includes professionally oriented, effective doctoral programs in education. In Spring 2001, the Chancellor raised the possibility of seeking legislative authorization for the CSU to offer a "stand alone" doctorate in the field of education administration and leadership. This action led to preliminary discussion about the desirability and feasibility of CSU doctoral programs in fields where the CSU has assembled significant expertise in its existing graduate programs and where there are few publicly supported and therefore widely accessible programs. These early discussions also contributed to the Senate's resolution.

The Governor's 2004-05 Budget Proposal and subsequent action by the CSU Board of Trustees introduced a graduate fee differential, renewing interest in differential costs of providing graduate education. The interdependence of fee cost/resource and faculty workload differentials is on the policy agenda once again link to the work of the Task Force.

The Task Force was convened in Fall 2001 and included eight faculty members, three graduate deans, and academic program staff from the Chancellor's Office. This group reviewed the various statewide data bases, campus accountability reports on graduate education, reports from entities within our state, and documents from other national and state-based organizations. Task Force work has included a review of the recommendations of the 1989 study of graduate education and particularly the recommended criteria for high-quality programs that were adopted as Trustee policy. This report examines the opportunities for significant expansion of the CSU role in providing graduate education in a number of emerging fields. Specific attention is given to the possibility of applied doctorates. Also noted is the growing demand for non-degree postbaccalaureate certificates, typically in applied technology and science-based professions. Finally, the report examines the costs of graduate education with particular emphasis on faculty

workload issues that affect how much funding is needed. This report represents the work of the Task Force and includes recommendations for action by statewide and campus Senates in collaboration with Graduate Deans, Provosts, Presidents, the Chancellor, and the Legislature.

EXECUTIVE SUMMARY

The previous study of graduate education in the CSU was completed over a decade ago, and its recommendations were considered during a period of declining state revenues. There was considerable disappointment that resources were scarce for funding implementation of the report's recommendations. Yet when the "bust" of the early 1990s was followed by the "boom" and consequent state budget surpluses of the middle and late 1990s, the relatively strong budgets did not include a differentiation of funding for graduate education or a full recognition of the workloads associated with graduate programs, as recommended in the 1989 study of graduate education. The Task Force is keenly aware that *this* report is being released during a time of unprecedented fiscal crisis in the state. We hope this report can be a focal point of renewed efforts and commitments to ensure that graduate education provided by the CSU, so critical to California's economic and societal strength, be funded adequately. Much is at stake.

Dramatic changes in California present challenges and opportunities for institutions of higher education. The complexity and increasingly global dimension of California's economy creates an increasing need for a highly knowledgeable workforce in which the state's population, rich in demographic diversity, must be prepared to participate. The changes require a responsive and adaptive educational system to design effective curricula and provide the requisite graduate education.

The CSU's coupling of educational equity and academic excellence is a key ingredient ensuring that California's demographics will be a strength, helping to produce an adaptable workforce, strong, diverse markets for California products, and a society in which mutual understanding and civility prevail.

The CSU is a dynamic and responsive system of regional campuses serving California that is capable of:

- Identifying and articulating critical postbaccalaureate needs.
- Selectively developing increased capacity to meet state needs.
- Linking to national and international markets and needs.
- Continuously integrating new and alternative modes of providing education—including technology-based and technology enhanced teaching and learning—when such modes are demonstrated to be effective.
- Forging critical partnerships with other societal sectors including business, industry, research organizations, government at all levels, K-12 schools, the community colleges, the University of California, independent institutions of higher education, non-profit organizations, and the community.

The CSU is uniquely capable of responding to state needs and exhibiting leadership in the development of graduate degree and certificate programs with a regional and applied focus. The Task Force found that a number of changes in California affect the needs for graduate education. These include increasing specialization of the economy coupled with a growing awareness of the interdependence of economic and social forces.

Changes in California That Affect the CSU

- Changes in California's economy are reflected in the growth of specialized graduate certificates and graduate degree programs. The current educational context also presents more opportunities for partnerships in education.
- From 1985 to 2003 ethnic minorities increased as a proportion of California's population, and the participation of underrepresented groups in the CSU graduate student cohort also increased, in some cases at an even greater rate.
- The most recent review of the California Master Plan for Higher Education emphasized an integrated system of education in California that links pre-school through K-12 and higher education and promotes partnerships among educational segments and with business and industry.
- New forms of academic technology are increasingly incorporated into graduate education in the CSU.
- Changes to K-12 education policy have reverberated in the CSU, which continues to lead the state in preparing K-12 educators—still in large part at the postbaccalaureate level.

KEY RECOMMENDATIONS

Master's Program Issues

- The professional Master of Science degree is emerging nationally as a model for advanced-level workforce development. Partnering with business and professional communities, where appropriate, to develop new and valuable graduate degree programs should be encouraged.
- CSU campuses are encouraged to discuss whether it is appropriate and valuable to designate a "graduate faculty," in part to recognize the distinctions between graduate and undergraduate instruction and their workload implications. In those discussions, campuses are encouraged to examine what should be expected of faculty who teach at the graduate level, including any special qualifications.
- CSU master's degree programs are encouraged, where appropriate, to develop links to and articulation with doctoral programs at UC and independent universities. Of particular interest are "bridge" programs that allow students in CSU master's degree programs to pursue a course of study with the assurance that a doctoral institution will recognize it as meeting a portion of the requirements for the doctoral degree.

Certificate Program Issues

- **Certificates represent a focused response to specific continuing education needs. They can also strengthen the pipeline for graduate degree programs.**
- The CSU should develop a standardized terminology for graduate-level certificates.
- CSU campuses are urged to develop further their own certificates policies. Campus policies for graduate-level certificate programs should address such elements as unit

requirements, links to academic departments, and admission standards appropriate to courses that could be part of graduate degree programs.

Funding Issues

- Funding for CSU graduate education must be reliable, stable, and sufficient. It should be
  - linked to a graduate differential in state financial support (e.g., through the redefinition of a graduate FTES, as proposed in the Trustees' budget for 2001-2002);
  - grounded in a full recognition of the work involved; and
  - incorporating recognition of the student and faculty research and scholarship critical to graduate education and the infrastructure needed to support them.
- While partnerships may lower the total cost of a graduate-level initiative by eliminating the need to duplicate certain resources, it should be recognized that sustaining most partnerships requires the investment of at least a modest amount of resources for continuing coordination. Policies and practices should be examined for their potential to become disincentives for collaboration.
- Internal campus policies and priorities need to reflect the campus's commitment, in resource and workload terms, to graduate programs.
- When resources to offer a graduate program wholly through state support are not available, CSU campuses should be free to explore a hybrid model, combining state support and self-support components programmatically while maintaining the fiscal integrity of each component.
- The CSU should continue to explore uses of academic technology and ways to fund it.
- The CSU should advocate aggressively for federal support of CSU research. Exploration of partnerships with the private sector that would enhance the CSU's research infrastructure is encouraged.
- CSU campuses are encouraged to explore a zero-unit enrollment policy that establishes a fee appropriate to the faculty work involved in thesis supervision that extends beyond enrollment in a thesis course.
- Greater flexibility in providing fee waivers for graduate students is encouraged.
- Current disincentives to sharing resources in a variety of graduate education partnerships constrains innovation. Strategies for reducing the impact of those disincentives can foster the development of new initiatives. The 2003 Report of the Academic Technology Planning Committee recommends an initiative, and potential starting point, that would proposed new policies and identify practices that would remove the fiscal disincentives to multi-campus collaborations.
- All doctoral education conducted by the CSU needs funding commitments at least equivalent to the funding commitments for joint CSU-UC EdD programs. The joint EdD programs should be monitored, especially with respect to the division of funds and workload parity, to determine whether the model should be extended to other joint doctoral programs.

Doctoral Program Issues

- Joint PhD programs have not in general lived up to their promise, though individual programs have achieved some success. The commitment to joint doctoral programs has been uncertain over time, the approval process is cumbersome, the funding has not been commensurate with the costs of current programs, and sufficient start-up monies have not been readily available. Ways to make joint doctoral programs more effective should be explored.
- The CSU is urged to study further the experience of the existing programs to determine the most useful practices for future joint work, with a special focus on faculty workload. Start up funding has not been consistently available for these joint efforts. We recommend funding and support for Joint PhD comparable to that provided the Joint CSU-UC Ed.D Program
- *If*
  - the need for publicly supported doctoral programs in one or more selected fields is well established,
  - the UC does not respond by developing its own doctoral programs or joint doctoral programs with the CSU,
  - the faculty at one or more CSU campuses has the expertise to offer the programs and is interested in doing so, and
  - adequate funding is made available,

  the CSU should seek the authority to offer doctoral programs in those fields, independent of other universities. A focus on applied fields and the education of advanced-level practitioners is encouraged.
- The Academic Affairs Committee of the Academic Senate CSU should create a subcommittee for doctoral program review and planning. In addition to program design, the subcommittee should consider issues of workload parity and dissertation supervision.
- CSU campuses are encouraged to develop policies and criteria for faculty participation in doctoral education. Comparable policies should apply to faculty in all the partnering institutions in a joint doctoral program. The CSU graduate deans are encouraged to stimulate campus discussion on these issues.

The CSU is a responsive, responsible, flexible higher education system that plays an important role in ensuring and sustaining California's prosperity and quality of life. It can play an even larger role, cost-effectively, if given the opportunity to do so.

TABLE OF CONTENTS

CHALLENGES FOR CALIFORNIA AND THE CSU

The CSU plays a unique and critical role in California's higher education at both the postbaccalaureate and the undergraduate levels. Its graduates are the "*economic engine*" of the state acting as key decision-makers, service providers, and influential innovators during periods of growth and change. They are well represented among the state's business, professional, civic and cultural leaders, and their sheer numbers provide a deep pool of knowledgeable contributors to California's economic and social health. The CSU's role is increasingly important given the direction and accelerated rate of change in economic, social, and environmental spheres within the state and globally. The CSU faculty is well prepared to respond by offering cutting edge graduate courses and programs in emerging fields as well as long established programs of proven value and quality in traditional disciplines.

This powerful network of faculty expertise in a variety of fields and disciplines critical to California is at risk because of protracted periods of budget constraints over the past 12 years. Resources have not been made available to support the levels of faculty and student research, scholarship, and creative activity that directly influence the effectiveness in teaching at all post-secondary levels. Investments in equipment, laboratories, and libraries have decreased to dangerous levels. In 2001, the ASCSU produced a major report, *The CSU at the Beginning of the 21st Century: Meeting the Needs of the People of California*, which documents these serious limitations produced by funding decisions.

Despite these barriers, the faculty and administration on each CSU campus have worked to develop the infrastructure needed to provide high quality education at the graduate level. Of all postbaccalaureate degrees, the Master's offers the most flexibility and thus is able to respond most quickly and effectively to California's changing workforce needs in this new millennium. The CSU has also demonstrated the ability to be a strong partner in joint-doctoral degrees. CSU faculty members are capable of offering high quality, cost-effective doctoral programs in applied areas. The state's higher education system does not provide doctoral education in critical areas as well as failing to produce enough graduates in others. The CSU is capable of offering doctoral programs in areas of need if properly funded. **The CSU has reached the stage where it can provide all levels of graduate education with quality, cost-effective programs.**

CHANGES IN CSU EDUCATION

Graduate education in the CSU and in the United States as a whole, has been both witness to and participant in significant changes during the period since the last systematic study of CSU graduate and postbaccalaureate education. Those changes have occurred in curriculum, pedagogies, and opportunities created through the use of technology. While many facets have changed, much has remained constant. The previous report, *The California State University Master's Degree: Implementation and Quality* (Dinielli, 1989), developed a set of quality indicators, which were adopted by the CSU Board of Trustees (see Appendix A). That extensive report affirmed the critical need for resources to support CSU graduate education. This report strongly reaffirms that expression of need. The absence of differential funding for graduate education within the CSU is a failure to recognize the additional responsibilities of advising, thesis and other research guidance, examination preparation and evaluation that faculty who

teach at the graduate level are expected to assume and which typically do not generate FTES, the primary basis for appropriation of state funding. These concerns about funding and necessary resources are developed further and with recommendations in a subsequent section of this report.

The changes described below have accelerated the need for graduate education. They also provide ongoing challenges for the CSU as it attempts to fulfill its mandate that includes both graduate and undergraduate education.

ECONOMIC CHANGES

California, as the world's sixth largest economy, in the last decade became more self-conscious about its own diversity, and the interplay of economic, environmental, and cultural dynamics in defining the state's challenges.

California's economy is complex, flexible, global, networked, and knowledge-based. This new economy is evolving to embrace new businesses, new sources of competitive challenges faced by all industries, and the integration of a multicultural immigrant workforce. Observers note that it is an "*economy of regions*" driven by different industrial concentrations that create wealth in specific parts of the state. Accompanying this evolution are rapidly changing skill demands, which frequently result in many people facing tenuous employment and uncertain career opportunities.

The global implications of California's economy are reflected in the increasingly critical role in world trade including its role as the home of the largest set of ports of entry and export. A recent study by the Public Policy Institute of California, *Business without Borders? The Globalization of the California Economy* (Shatz, 2003), observes that "*California firms tend to be more active in those aspects of globalization that are growing fastest—for example, in the export of computers and electronic products and in the export of services in the legal, technical, and entertainment sectors.*"

Impact on the CSU. These changes in California's economy are apparent in the relative growth of graduate certificates and graduate degree programs. Although the more dramatic population increases have been in the population traditionally of "college age," the growth in the number of master's degrees awarded was proportionately greater than the growth in the number of bachelor's degrees awarded in California from 1990-1991 to 2001-2002. More people are assuming that graduate education will be part of their lives; according to a recent study by the National Center for Education Statistics, four years after college graduation, 72% of the baccalaureate degree recipients who had *not* entered graduate education expected to earn a graduate degree during their careers. The CSU continues to award about a third of the master's degrees earned in the state. CSU master's degree programs have recently been created in such fields as Biotechnology, Multimedia, Software Engineering, Viticulture and Enology, Polymers and Coating Science, Transportation Management, Regenerative Studies, and Teaching International Languages, while enrollments have continued to grow in established fields such as education, the health professions, and information sciences.

DEMOGRAPHIC CHANGES

The 2000 Census reported that California increased its share of the U.S. population to 12.3%, approximately 34 million residents. California has become the major entry destination for immigrants, just as the east coast was for much of the last century. One in four residents of the state's population is foreign born, an increase of 10% since the 1990 census. Census 2000

showed that the total of all ethnic minority populations constituted more than 53 percent of California's population, also an increase of 10% since the previous census.

Impact on the CSU. From 1985 to 2001 these demographic changes were reflected in the increased participation of underrepresented populations in the CSU graduate student cohort. *CSU Statistical Reports* details the ethnic growth of CSU graduate students. African Americans grew from 4.1% to 7.8% of the total graduate student enrollment; Asian Americans grew from 10.0% to 15.6% and Hispanics from 6.4% to 17.9%. American Indians declined slightly from 1.2% to 1.0%. During the same period, the percentage of women in the graduate student population grew to a level over 60%, exceeding the national average for the last 20 years.

INCREASED POLITICAL AND PUBLIC EXPECTATIONS OF PARTNERSHIPS/COLLABORATION AND ACCOUNTABILITY

State legislatures across the country have been demanding accountability from public institutions of higher education. In some states, funding has been linked to increases or decreases in outcome measures. Regional and specialized accrediting agencies have also shifted their focus from input -- the resources that universities bring to their educational endeavors – to educational outcomes. Along with the expectations for accountability, is an expectation that public institutions collaborate with each other and engage in partnerships to achieve goals efficiently and effectively.

Impact on the CSU*:* CSU programs at all levels are increasingly expected to define and measure educational outcomes and to use the results to guide program improvement. These assessment activities, while valuable, do not themselves generate funding but require considerable faculty, staff, and administrative effort. The most recent review of the California Master Plan for Higher Education moved away from the historic emphasis on differentiating the state's public postsecondary institutions to an emphasis on an integrated system of education in California that links pre-school through K-12 and higher education. It promotes partnerships with other segments (e.g., joint doctoral programs, efforts to make transfer from the community colleges to the CSU smoother) and with business and private industry.

INCREASING USE OF ACADEMIC TECHNOLOGY AND OPPORTUNITIES FOR "MODULARIZATION" OF CURRICULA

Innovations in academic technology present opportunities for new modes of teaching and learning less subject to the older limits of time and space. These changes also present the chance to reconsider the structure of graduate education. These innovations lend themselves especially well to shorter formats, such as graduate certificate programs and modules that can be incorporated into graduate degree programs.

Impact on the CSU*:* Graduate programs involve increasing use of various forms of academic technology. Online graduate programs include an MS in Quality Assurance (CSU Dominguez Hills), a certificate and MS in Education with Option in Online Teaching and Learning (CSU Hayward), and a post-professional MS in Occupational Therapy (San Jose State University). The newly released *CSU Report on Academic Technology Initiatives* identifies future directions for multi-campus collaborations among faculty in a discipline, including the development of course modules that multiple campuses could use in their respective graduate programs. The need to support technological innovations, however, competes for human resources with traditional activities necessary to sustain an academic program. In the long run, exploitation of academic technologies will be slow and uneven without appropriate budget augmentation.

PUBLIC POLICY CHANGES

The CSU is expected to respond to short and long term state needs, whether predictable or not. K-12 teacher preparation provides an example. The number of teacher retirements at all levels in the education system is coupled with population growth creating a major public policy concern. The consequence of this predictable long-term trend was accentuated by the public policy effects, in the short term, of mandated class size reductions in the 1990s. Federal and state laws and regulations governing the practice of other professions (e.g. social work, nursing) also have educational dimensions.

Impact on the CSU: K-12 education has been a major focus of public attention in recent years, and the multiplicity of governmental mandates has had significant impact on the scope and content of the educational preparation of teachers and other school employees. As might be expected of the system whose mission in law highlights "professional education," the CSU continues to be the leading producer of educators in California. Although some students may earn Level-1 basic teaching credentials concurrently with baccalaureate degrees (in "blended" or integrated teacher preparation programs), many students pursue professional preparation for teaching only after they have earned baccalaureate degrees. A very large proportion of the professionally oriented instruction leading to teaching credentials is at the postbaccalaureate level. Moreover, the CSU awards more master's degrees in Education than in any other field, and many of the master's programs in liberal arts and sciences serve teachers as well. Hence a large part of the CSU's post-baccalaureate and graduate activity is affected by policy changes to K-12 education.

Recent and projected changes in the requirements for practicing such other professions as audiology, physical therapy, and accounting have also had consequences at the graduate level for CSU instructional programs.

Changes in the environment in which CSU graduate education operates are often interconnected; change in one area may affect another, and their impacts are compounded. For example, the level of workforce readiness may differentially affect the growth of certain industries, which may in turn affect the future demand for employees educated at the graduate level as well as the state of California's economic health – and ultimately state tax revenues and the resources available to the CSU to meet the demand for graduate education. These interactions are complex, but one trend is clear: more citizens need to become educated at the post-baccalaureate level if the economy and society of California are to function effectively.

The CSU is the most flexible and responsive educational system in the state to meet that need.

WHY THE CSU IS CAPABLE OF MEETING THE CRITICAL NEEDS

CSU graduates form the innovative professional infrastructure of California. They are the teachers, nurses, small business owners, public administrators, civil engineers, and computer technicians; and CSU Master's graduates are the leaders of those professions. More than 14,000 Master's degrees were awarded by the CSU in 2000-01, including 4,494 in Education; 2,470 in Business and Management; 1203 in the Health Professions, and 1347 in Public Affairs and Services.

The CSU's strengths allow it to respond rapidly and effectively to changing workforce needs and to contribute to accommodating the large numbers of increasingly skilled graduates needed for California's workforce. The CSU's inherent strengths include an adaptable education infrastructure, faculty expertise, and its 23-campus regional network.

CSU POSTBACCALAUREATE EDUCATION INFRASTRUCTURE

Much of California's increasingly complex workforce needs requires more preparation than provided by the bachelor's degree but less than the doctorate. While this certainly is true in technical areas such as engineering and the natural sciences, areas such as the social sciences and the applied and professional fields are seeing increased preparation requirements, and in general this is the case for most professions. The CSU already has the required, extensive infrastructure that is adaptive and flexible and capable of creating new programs in response to emergent local and regional contexts.

At times, the need for a revised master's degree can be met best through the development of interdisciplinary degrees. Given the many years of experience designing and implementing current quality master's degrees, the CSU faculty is in a much stronger position to provide the degrees most needed to meet evolving workforce demands than any other higher education system in California. Specific examples of this capacity are discussed in the next section.

FACULTY EXPERTISE IN MANY CUTTING-EDGE AND SUPPORT DISCIPLINES

The CSU faculty is well qualified through their doctoral education and continued research, scholarly, and creative activities to provide quality postbaccalaureate education, including doctoral education. CSU faculty maintain active research and scholarship for reasons that include the following: to assure their teaching is current and of high quality; to involve graduate (and undergraduate) students in research and scholarship before entering the job market or doctoral programs; to help satiate their inherent excitement about their discipline; and to model appropriate professional and academic behaviors.

The CSU faculty's scholarly activities are most often embedded in the activities of businesses, government, and community-based organizations. The faculty has a direct feel for the challenges facing regional employers and service providers. Their supervision of internships, as well as links with non-traditional students/working professionals seeking graduate education, is invaluable for obtaining feedback about existing programs as well serving as a stimulus for the development of new curricula.

TWENTY-THREE CAMPUS REGIONAL NETWORK

The CSU's 23 campuses and off-campus centers have the largest postbaccalaureate capacity in California. This network allows faster response times for master's degree and advanced certificate program revisions than is possible at other California campuses. The system is more effective in accommodating new students and returning students desiring to update or retool in response to economics or the changing workforce mix.

This 23-campus regional network has a demonstrated continuing commitment to equity, access, and academic excellence that helps assure the needs related to California's changing demographics will be met. The CSU has the greatest experience reflecting the heterogeneity of California and offers the greatest probability of success in providing quality education to California residents who are the first in their families to pursue a postbaccalaureate degree. The regional network is reinforced by the pattern of graduates remaining within each CSU campus

region where they continue to make contributions to the local economy and community. As an example, 1 in 26 residents of the six county Capital Region is a CSU Sacramento alumnus.

THE CHALLENGES TO QUALITY IN MEETING CRITICAL NEEDS

A number of challenges threaten to erode the ability of the CSU to provide quality graduate education to meet these critical needs. Many are resource based, either in basic funding terms or in the system's flexibility to allocate and use resources to support graduate programs. The ASCSU's seminal work on these challenges, *The CSU at the Beginning of the 21st Century* documents the decline in many resource indicators during the last decade and makes a series of recommendations for future resource allocation.

INADEQUATE RESOURCES

The California Department of Finance argues that the current single marginal cost/funding formula for FTES understates graduate education and overstates undergraduate education costs resulting in a single amount that is a *"reasonable balance"* between the two. However, the amounts involved in this compromise are negotiated, and no longer data based. CSU student funding is not based on objectively determined need costs. This simple model devalues graduate education because it fails to consider the extensive, unique, and demanding factors involved in its provision. Graduate programs contain different and more demanding work procedures than do undergraduate programs. This single-allocation approach has led to a consistent decline in the absolute dollar value of the FTES that is exacerbated further by annual inflation. Current graduate education is being funded inadequately with an assumed amount that deteriorates annually.

The single marginal funding formula is oriented to undergraduate instruction, the major demand on CSU resources. In the CSU, it can be persuasively argued that the marginal funding amount is even inadequate for undergraduate program support. Consequently, to address funding needs of graduate programs, it is important to reiterate the proposal of *The California State University Master's Degree: Implementation and Quality* (Dinielli, 1989), which justifies a graduate funding differential.

INTERNAL CAMPUS ALLOCATION OF RESOURCES

There is the critical need to examine internal allocation of resources at the campus level between graduate and undergraduate instruction. A number of forces affect current internal allocation patterns. Dinielli's 1989 report defined a set of quality indicators (see Appendix A) and urged reviews to determine whether or not some graduate programs warranted continuing. Eight years later, the Cornerstones' Task Force IV report (1997), *CSU and the Economy: The Need for Postbaccalaureate, Graduate and Continuing Education of the Cornerstones Project,* recommended the establishment of "*quality parameters for program continuation"* as a means of *"facilitating curricular innovation*." Those recommendations point to the issue of campus culture and the need for leadership in making tough choices when resources may need to be redirected.

Another aspect of this challenge is inter-campus discussion and deliberation about the appropriate/desired balance of undergraduate and graduate instruction to strengthen the resource investment possibilities for postbaccalaureate instruction. Some campuses have done valuable work in this area and could serve as models and leaders for others.

GRADUATE FACULTY WORKLOAD

The workload differential between graduate and undergraduate instruction is not recognized at most levels resulting in inadequate resources being directed to graduate education. As noted earlier, this is an artifact of the marginal funding formula not recognizing a per student funding differential when allocating resources from the state to the CSU. At the campus level, FTES targets and instructional workload still rely on a single calculation combining undergraduate and graduate teaching. In most departments, faculty members teaching at the graduate level do not receive workload recognition for the many additional hours involved in the varied aspects of graduate programs.

It is worthwhile to consider again the workload factors associated with quality graduate program conduct and instruction. These factors and activities do not exist in the conduct of CSU undergraduate programs. The following are some of the tasks to be incorporated into quality graduate programs (as accepted by the CSU Board of Trustees): thesis exploration; thesis direction; thesis committee work; demonstration of each student's oral and written communication skills; the supervision of integrated internships and practica; the provision of a culminating experience; review of student applications and student selection; monitoring individual student progress; the training of graduate students for teaching; the provision of extra academic resources (e.g., library, technology, research facilities); and recruitment of potential graduate students.

BARRIERS TO MULTI-CAMPUS SHARING OF RESOURCES

A number of traditional policies and practices hinder the potential and capacity of the 23-campus network to interact effectively. There are no agreed upon protocols for adapting the numerous allocation formulas (e.g. FTES enrollment targets) to a multi-campus environment. Curriculum development on a multi-campus basis is frequently clumsy and time-consuming. The *Academic Technology Plan* examined multi-campus collaborations using technology to expand access to the specialized expertise of various campus programs and faculty. That report recommends an initiative that would propose new policies and identify practices that would remove the disincentives to fully develop the 23-campus network as an educational institution.

STRUCTURAL AND LEGAL BARRIERS

The Cornerstones Report (1997) asserted that positive opportunities involved in integrating "*programs in both the state-supported and fee-supported modes"* and called for the development of *"specifics of a more integrated program . . . including the proper institutional and financial relationships*." During the intervening years, there have been some attempts to design innovative programs that include a "*mix*" of continuing education and general fund support. These innovations have sought to distinguish between the integration of academic programs and the integration of funding sources (which by law must remain separate and distinct for auditing purposes).

Concern about these structural and legal barriers in the funding and administration of instructional programs has added an air of caution in the development of partnerships to strengthen graduate education opportunities with industry, government, and other educational institutions. The recent Memorandum of Understanding between the CSU and UC to support the development and implementation of Joint-Ed.D. programs includes commitments to "*parity*" in financial relationships and faculty workload. These principles may support innovations that will

in turn lead to new learning about and coping strategies for these administrative barriers, possibly increasing resources for graduate education.

SUMMARY

The quality and potential of CSU graduate education continues to be eroded. Graduate programs in the CSU are handicapped by a failure to be adequately funded and recognized for their demands, which differ significantly from undergraduate education. Despite those restrictive influences, the CSU continues to prepare the most graduate students in the fields that fuel California's economy and support the public service infrastructure. Certificate and Master's education are increasingly important for responding to emerging needs for skilled professionals. The CSU could excel in this critical role because it has unprecedented and unequaled experience with educating a diverse student population. This report provides recommendations for addressing the barriers to quality graduate education and the ability to accommodate more graduate students and programs in the CSU.

As modern society increases in the sophistication of its technology, social, and physical domains, education is the single, most influential pathway to success. Whereas a half-century ago a high school diploma was the basic educational requirement for a productive and satisfying life, it was replaced almost a quarter century later by a bachelor's degree. At this time, a graduate degree has become the recognized level of adequate education for advancement in many professions (e.g., an MBA in business and a M.Ed. in public education). California has to respond to that need and the CSU is the best avenue for providing that response.

MEETING TODAY'S NEEDS

THE VALUE OF POSTBACCALAUREATE AND GRADUATE EDUCATION TO CALIFORNIA

Postbaccalaureate education is both central and crucial to the CSU's mission. There are many benefits to having postbaccalaureate programs for students, institutions, and the state of California. This report primarily examines appropriate benefits for the state.

Postbaccalaureate education provides students with highly specialized tools, content, and developed capabilities for greater depth of exploration, and understanding. In hundreds of academic fields, degrees and courses enable students to progress further in fields of interest and employment, enabling them to become licensed or qualified in a variety of applied areas. They also provide students with skills and understandings to become more effective mentors, entrepreneurs, and practitioners. These programs enable students to advance, to gain greater salary, and have a stronger impact on all sectors of California's society.

Graduate programs are critical and central to the economy of California. Graduate students in the sciences, engineering, technology, and agriculture have formed the critical and important technological leadership and mid-level technological workforce for the state. They are the small-business, software, and inventive service providers. They are the mid-level and senior staffers in California's government and public sector organizations, from county government to city government to regional and state and federal agencies. They are the CEOs and CFOs of the majority of the small and mid-level businesses and organizations in the state. They represent 60 to 70 percent of all teachers and teacher administrators in the state. CSU graduates are in every level of the state's tourism and entertainment industry. CSU postbaccalaureate students go on to become the intellectual wealth that drives the state economy.

At the very moment the California needs to improve and nurture its intellectual wealth, there has been a decline in the number of graduate students produced by the CSU in relation to the production of the state's private universities. Private institutions, because of their high cost, reduce California residents' opportunities to access high quality, affordable graduate education. The majority of graduate students from underrepresented populations who apply to, are accepted for, and complete UC Ph.D. programs come from M.A. programs in the CSU.

Whatever investment the State of California can make in support of the CSU's postbaccalaureate programs will result in extensive long-range economic benefits through the creation of new jobs, new economies, and new innovations. The CSU is an incubator for pragmatic and practical ideas that are needed for the engine of California's economy.

In addition to the benefits to the State of California, the institutional benefits of graduate education are often under-recognized:

1. Graduate students are a labor pool for lower division courses and teaching support staff, which also provide additional FTES. By providing a source of reasonable and cost effective, yet highly qualified, teaching assistants, graduate students enable faculty to be even more productive while at the same time taking courses and providing the California State University with additional income.

2. Graduate students enable faculty to focus on their specialty and provide a highly stimulating interaction and teaching direction.
3. Graduate students are essential for research, grants, and contract work done by the CSU faculty. They bring a wealth of experience and understanding to projects while at the same time learning new methods and approaches to their fields.
4. Graduate students play essential roles in assuring quality undergraduate education through their participation as teaching and laboratory assistants and models for undergraduates to pursue postbaccalaureate education at all levels.
5. Strong graduate programs attract the best new faculty. Graduate students add value to the CSU because they enable it to recruit better-qualified faculty. Graduate students add value to the human workforce and enrich its educational mission.

MASTER'S AND DOCTORAL DEGREES AWARDED BY CSU

This section begins with a discussion of general trends in graduate education in California and within the CSU. The diversity of graduate education within the CSU is then reviewed along with a discussion of challenges and emerging opportunities. Post baccalaureate programs which grant credentials to teachers in K-12 education are a critical dimension of the mission of the CSU. There have been a number of recent CSU reports on the status and unique needs of these K-12 related education programs and therefore they are not the subject of this report.

The CSU awards more than two-thirds of the master degrees from public institutions in California. However, independent colleges and universities award more master degrees than public institutions (see Table 2).

Within public institutions, not surprisingly, the number of doctoral degrees granted is overwhelmingly in favor of the University of California. The number of doctorates awarded through public institutions has not increased since 1997-8. Over the past decade, independent colleges and universities have grown to award the greatest proportion of doctorates when compared to public institutions. These figures demonstrate that the private sector is carrying the greatest load for providing graduate education opportunities in California. That also means a great proportion of California doctoral degrees are only accessible to those of substantial means.

The previous graduate study report (Dinielli, 1989) reported the diversity and size of CSU graduate degrees and programs as follows:

- master's degrees awarded (1949-1986) were about 1 in 6 of all degrees awarded
- 162 degree titles were awarded in 21 discipline categories
- degree production stabilized in some social sciences, foreign languages, letters, and fine arts while education, public affairs, health sciences, and physical sciences held gains from early 60s and 70's; new growth was seen in business, computer and information sciences, and engineering.

The report concludes "*growth in a number of the professional and more applied degrees is currently evident . . . at the same time, significant enrollment declines in liberal arts and sciences disciplines may warrant reconsideration of priorities or program objectives.*" The report further observes "*some of the Advisory Committee's recommendations provide specific yardsticks with which to judge programs and priorities.*"

The data presented below (see Table 1) show the same variation in number of degrees awarded by disciplinary clusters as the earlier report. Education, health professions, public affairs and

services, and business and management continued to grow in graduate enrollments during the 1990's. The data also indicate there is an acceleration in the growth of graduate degrees vis a vis undergraduate degrees (37% compared to 13%).

While the CSU awards the largest number of bachelor degrees in the state, it also produces a significant percentage of the master's degrees. In 2001, according to CPEC data, the CSU awarded 14,327 master's degrees in a wide range of applied and theoretical fields. That accounts for 33 percent of the master's degrees awarded statewide and is more than double the number awarded by the UC. The other 53 percent of master's degrees were awarded by independent colleges and universities at a much higher cost to California residents.

Doctoral degrees, although relatively small in number, have grown by a similar percentage over the same period (see Table 2). In 1990-1, three campuses awarded more than 1,000 master's degrees each. In 2000-1, seven campuses awarded more than 1,000 degrees with another granting more than 900. The increased demand for graduate education has exceeded or at least been equal to that of undergraduate education.

Joint-doctoral degrees granted by the CSU, as one might expect, have grown but are still a very minor portion of CSU degrees. However, the relatively slow growth of doctoral degrees suggests that this type of work has taken a backseat to undergraduate and master's level instruction. Another plausible explanation is the legislative restrictions placed on the CSU for doctoral work. Some change in that legislation is warranted and will be addressed elsewhere in this report.

DISCIPLINE EMPHASES IN CSU GRADUATE DEGREE PRODUCTION

In 2000-1, the CSU granted more than 1,000 master degrees in each of four areas: education, business and management, health professions, and public affairs and services. As would be expected, doctoral degrees in education have the highest proportion of graduates within the CSU. Psychology is the next most popular doctoral area.

Table 1 contains enrollment changes that differ across disciplines. A number of influences account for these variations.

- The CSU has committed to a number of popular and/or needed programs (e.g., nursing, social work, education), which are not offered in the UC, making the CSU the only public institution providing these programs. Other, more specific programs are only offered by the CSU (e.g., forestry, wildlife).
- Programs with a large number of undergraduates, providing both specialized degree and general education courses (e.g. psychology, business); can afford to offer relatively full and attractive graduate programs. Without substantive undergraduate enrollments driving funding, extensive graduate programs (e.g., foreign languages) usually cannot be supported in the CSU.
- Some CSU campuses cannot offer graduate degrees in particular disciplines because of non-existent infrastructure (e.g., laboratory facilities, equipment supplies, appropriate departments). There is an emerging trend of urging faculty to seek external funding as the only avenue for supporting specific infrastructure developments.

Table 1. Graduate Degrees Conferred by Discipline Division, from 1990-1 to 2000-1.

Discipline Division	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001
Master Degrees											
Agriculture and Natural Resources	100	111	89	97	66	76	75	82	74	84	78
Architecture and Environmental Design	70	86	80	102	74	93	98	90	76	70	78
Area Studies	9	15	28	31	22	41	27	38	39	30	35
Biological Sciences	152	167	201	164	168	206	197	184	222	219	240
Business and Management	1,690	1,789	2,076	1,968	1,996	1,784	1,858	2,345	2,306	2,341	2,470
Communications	109	129	123	148	128	131	115	155	179	155	148
Computer and Information Sciences	265	328	295	331	253	326	266	255	308	389	489
Education	3,154	3,199	3,417	3,519	3,252	3,195	3,256	3,558	4,073	3,950	4,494
Engineering	675	754	876	857	751	793	683	727	753	682	715
Fine and Applied Arts	338	384	433	372	383	302	374	368	387	326	327
Foreign Languages	72	72	108	90	79	80	80	103	106	97	113
Health Professions	669	771	838	1,161	1,037	1,040	1,072	1,154	1,153	1,275	1,203
Home Economics	98	101	99	88	96	97	90	77	78	92	88
Letters	715	727	928	928	867	885	790	999	868	865	833
Library Science	116	171	172	153	171	173	143	127	163	152	211
Mathematics	104	105	133	101	113	129	110	123	121	132	113
Physical Sciences	187	173	142	145	145	173	139	141	115	143	120
Psychology	411	454	486	517	440	488	508	461	518	441	449
Public Affairs and Services	1,018	1,124	1,167	1,194	1,262	1,224	1,253	1,365	1,327	1,329	1,347
Social Sciences	405	463	559	499	598	640	515	572	596	530	568
Interdisciplinary Studies	130	141	197	213	179	223	192	209	226	242	208
Total, All Programs	10,487	11,264	12,447	12,678	12,080	12,099	11,841	13,133	13,688	13,544	14,327
Joint-doctoral Degrees											
Biological Sciences	1	4	4	4	6	2	3	10	4	7	4
Education	9	8	12	20	19	14	17	34	19	15	18
Engineering	—	—	—	—	—	1	2	4	1	—	—
Health Professions	—	—	—	—	—	—	2	6	3	2	—
Physical Sciences	4	2	2	6	1	3	—	2	1	—	1
Psychology	9	7	7	7	7	10	11	23	7	12	9
Social Sciences	—	—	—	—	—	—	—	3	2	4	4
Total, All Programs	23	21	25	37	33	30	35	82	37	40	36

- CSU faculty are increasingly urged to obtain external grants ("*soft monies*") to support graduate education/students. This is particularly true for areas within the sciences and health professions. This is a short-term solution that needs to be eventually replaced by some permanent funding.

These influences do not stimulate enrollment growth in all disciplines.

Departments and programs that have not experienced growth contribute to the balance and variety in graduate offerings. The data reveal a continued growth in the professional graduate degrees and a parallel decline in liberal arts graduate work. For example, during the period 1990-91 to 2000-01, Business and Management programs grew by 46%, Education by 42% while Letters and Mathematics grew by 16% and 8% respectively. These liberal arts and sciences CSU graduate programs are threatened by increasing funding pressures. Yet, these graduate programs are essential both to the academic strength of the institution and the preparation of future faculty.

THE DIVERSITY OF GRADUATE PROGRAMS IN THE CSU

The CSU offers a wide variety of graduate programs reflecting the diverse needs and interests of both the students and the economy in California. It has met the challenge of the 1960 *Master Plan for Higher Education* that assigns to the CSU the "*primary function*" of providing "*instruction for undergraduate and graduate students through the master's degree, in the liberal arts and sciences, the applied fields, and in the professions, including the teaching profession…the doctoral degree may be awarded jointly.*" The CSU's regional orientation has linked it directly to the economy and public needs of a specific geographic area that permits a unique variety of applied, professional programs. At the same time, the CSU has a rich tradition of graduate programs leading to the Master of Arts and Master of Science degrees. The continuum of offerings includes non-degree postbaccalaureate certificates, master of arts and science degrees, professional master's degrees, professional master's of science degrees, and joint-doctoral degree programs (both Ph.D. and Ed.D.). The Task Force considered the significant role and mission of the CSU in postbaccalaureate programs in the field of education. After reviewing the significant number of recent CSU studies and reports on credential programs, the Task Force decided not to address the unique circumstances of postbaccalaureate programs.

Table 2. Graduate Degrees Conferred by California Colleges and Universities, from 1990-1 to 2000-1.

Year	California State University		University of California		Independent Colleges and Universities		State Total
	Number	Percent	Number	Percent	Number	Percent	Total
Master Degrees							
1990-91	10,487	34.0	6,311	20.5	14,016	45.5	30,814
1991-92	11,264	34.3	6,499	19.8	15,075	45.9	32,838
1992-93	12,447	36.3	6,417	18.7	15,436	45.0	34,300
1993-94	12,678	36.3	6,645	19.0	15,624	44.7	34,947
1994-95	12,080	32.5	6,109	16.4	18,998	51.1	37,187
1995-96	12,099	32.7	6,120	16.6	18,749	50.7	36,968
1996-97	11,841	35.0	6,245	18.4	15,792	46.6	33,878
1997-98	13,133	36.5	6,258	17.4	16,571	46.1	35,962
1998-99	13,688	35.0	6,279	16.0	19,195	49.0	39,162
1999-2000	13,544	32.3	6,462	15.4	21,888	52.2	41,894
2000-01	14,327	32.8	6,437	14.7	22,973	52.5	43,737
Doctoral Degrees*							

1990-91	23	0.5	2,476	55.4	1,973	44.1	4,472
1991-92	21	0.4	2,530	53.7	2,156	45.8	4,707
1992-93	25	0.5	2,675	55.3	2,137	44.2	4,837
1993-94	37	0.7	2,827	55.3	2,246	44.0	5,110
1994-95	33	0.6	2,814	53.1	2,449	46.2	5,296
1995-96	30	0.6	2,724	52.4	2,445	47.0	5,199
1996-97	35	0.7	2,789	53.2	2,414	46.1	5,238
1997-98	82	1.5	2,775	49.7	2,729	48.9	5,586
1998-99	37	0.7	2,632	51.7	2,422	47.6	5,091
1999-2000	40	0.7	2,729	50.3	2,655	48.9	5,424
2000-01	36	0.6	2,729	48.0	2,915	51.3	5,680

*****California State University doctorate degrees conferred jointly with the University of California. The above figures do not include Candidate in Philosophy recipients at the University of California. Additional information can be found on the World Wide Web using the Integrated Postsecondary Education Data System (IPEDS) site at <*www.nces.ed.gov/IPEDS*> or the California Postsecondary Education Commission (CPEC) site at <*www.cpec.ca.gov*>. Source: California State University Enrollment Reporting System, Degrees; University of California Statistical Summary of Students and Staff, Degrees Conferred; California Postsecondary Education Commission Degree Type Data Abstract; and The Association of Independent California Colleges and Universities, IPEDS Degree Completion Surveys.

POSTBACCALAUREATE CERTIFICATE PROGRAMS

Changing needs and job opportunities that have occurred during the last decade have triggered new trends and requirements in post-secondary education. One of those trends has been the growth in postbaccalaureate certificate programs.

A certificate program is a sequence of courses consisting of a specific number of academic units, typically 9-15 semester units that provide instruction in a coherent body of knowledge within a specialized field. It leads to the attainment of a specified set of learned objectives.

These programs are designed to meet the growing demand from individuals and organizations wishing to enhance intellectual mastery in a specific knowledge area or a technical field. They also represent opportunities to design and offer new courses in an emerging field. Many universities accept some or all of the academic credits earned in a graduate certificate as credit towards a master's degree. Thus, these certificates may offer a bridge to a master's degree.

Graduate certificates serve as opportunities for introducing innovative approaches to post secondary education. They can often be designed to serve as feeders to traditional master's degree programs. Advances in academic technologies have made it possible for postbaccalaureate education to overcome distance barriers and reach a broader base of interested students. There is a growing need in the corporate community for focused educational programs to be offered on site with a saving in time and costs. This demand represents a growing market for CSU certificate programs, especially those that target emerging professional and technical fields.

It is important to distinguish graduate certificates that offer academic credit from professional development certificates that are offered for continuing education. Graduate certificates are offered in collaboration with academic departments and therefore have an academic rigor comparable to that expected in graduate programs.

Currently, many universities across the country offer graduate certificates via the internet and through other modes of delivery. This trend is expected to continue in the future. Certificate programs should grow as an adjunct to graduate degrees. California has such needs and the CSU has the expertise to provide this educational niche.

CSU Hayward's *Biotechnology Certificate Program* is offered in cooperation with the Center for Optical and Electron Microscopy. Established in 1986 the BCP provides the State of California with much needed personnel requirements for the continuing rapid expansion of the Bay Area biotechnology industry. Staffed by research faculty from the departments of Biological Sciences and Chemistry, the BPC is a competitive, limited enrollment program emphasizing close supervision and instruction in current theoretical and practical training in molecular life sciences.

Sonoma State University offers a post-master's *Family Nurse Practitioner Certificate* Program. The 11-month, 31-unit program is offered through SSU's Nursing Department. The post-master's *Certificate Program in Art Therapy* is available to professional counselors and others with M.A. or M.S. degrees in related fields. It fulfills the post-certification hours required for registration with the Art Therapy Certification Board.

CSU Stanislaus offers an academic certificate program in Community College Leadership designed in collaboration with area community college districts to strengthen the quality of candidates for leadership roles. Blending knowledge and practice, the program is rich in problem and field-based learning including an internship where students hone their skills on actual issues and concerns.

Recommended Action. The Task Force encourages campuses to continue to explore the opportunities for offering postbaccalaureate certificates which meet specific regional professional preparation needs and which can serve as connecting links to graduate degree programs. Standards for admission, graduation, curriculum, faculty qualifications and other considerations for program review must be carefully considered before initiating graduate certificate programs. For admission into graduate certificates programs, the same minimum criteria used for admission into CSU graduate programs should be applied. Similar standard criteria should also be used to ensure high quality of curriculum design, faculty qualifications, and graduation requirements. Graduate certificates should be reviewed regularly and adhere to standards normally used in graduate program reviews.

MASTER OF ARTS AND MASTER OF SCIENCE DEGREES

M.A. and M.S. degrees in the liberal arts and sciences have provided many different academic or career pathways. For some, the degree has provided entry into teaching either in combination with a secondary teaching credential or at the community college level. The M.A./M.S. has prepared community college faculty to provide a significant amount of the general education for CSU baccalaureate graduates. Other degree holders have pursued Ph.D. studies and have either formally or informally articulated their CSU coursework with the doctoral granting institution. A CSU master's degree is an especially important bridge to the Ph.D. for "late bloomers" and other non-traditional doctoral students. These degree holders are likely to have a greater diversity of

experience than faculty who proceeded lockstep through a k-20 education. The relatively intense immersion of M.A./M.S. students in the disciplines may serve to stimulate both undergraduates and faculty to greater intellectual engagement.

Innovations within the M.A. and M.S. Degrees

The M.A. and M.S. programs have also accommodated the growth and change in the basic disciplines such as TESOL (Teaching English as a Second Language) with English or Biomedical Engineering within Engineering. In addition, M.A. and M.S. programs have provided impetus for a number of interdisciplinary offerings. The field of Gerontology, which has a number of graduate programs in the CSU, is one example of the emergence of an interdisciplinary graduate program that draws upon the sciences, social work, and nursing.

The Master of Science in Genetic Counseling at CSU Northridge is offered through an interdepartmental program sponsored by the Department of Biology, the Department of Educational Psychology and Counseling, and the Department of Special Education.

CSULB offers an Master of Arts in Global Logistics that is directly tied to the interests of the Ports of Los Angeles and Long Beach and is aimed primarily at people involved in the shipping industry. The multidisciplinary curriculum involving departments of Economics, Civil Engineering, Management and Human Resource Management, and Public Policy and Administration, prepares professionals to manage the process of planning, implementing, and controlling the efficient flow of goods, services, and related information from point of origin to point of consumption.

The Master of Arts in Cultural Resources Management at Sonoma State University produces professionals who are competent in the methods and techniques appropriate for filling cultural resource management positions, which in many cases have been mandated by cultural resources legislation and scientific standards within planning processes.

Links to Doctoral Programs

Many CSU campuses and their graduate programs have a strong history with doctoral degree granting institutions. Based on the National Science Foundation's top-25 rankings for "*Master's Colleges and Universities with Linkages to Ph.D. Programs*," Humboldt State University ranks number one per capita in Ph.D. recipients in Science and Engineering by a baccalaureate institution, seventh in Ph.D. recipients in Biology and Agriculture, second in Earth and Ocean Sciences, and fifth in Mathematics. It should be noted that these rankings are for all colleges and universities, not just some smaller category such as comprehensive universities. San Francisco State University has a significant history of graduate program collaboration in a number of disciplines with the University of California, Berkeley.

The CSU also has cooperated with the University of California in offering "*bridge*" programs that transition CSU master's degree students into UC doctoral programs. Many of these programs are funded by the National Science Foundation and the National Institute of Health. These programs permit master's students who have the ability to do advanced graduate work but may lack some skills and preliminary preparation to get the training and mentoring they need in order to go on to become successful students in UC doctoral programs. These bridge programs have been particularly effective in assisting students from underrepresented groups.

The Center for Environmental Analysis (CEA-CREST), established at CSU, Los Angeles in Fall 1998 with a major grant from The National Science Foundation (NSF), offers students opportunities for focused and interdisciplinary research in the environmental sciences both while pursuing their master's at CSULA and their doctorate at a UC campus (currently a formal agreement is in place with UC Santa Barbara) Student training is enhanced through participation in the center research teams, the interdisciplinary curriculum, and the university accredited internships with off-campus agencies. Teams of senior scientists from biology, chemistry, and geography advise student collaborators in specific areas.

With funding from NIH, San Francisco State University has developed such programs in the biological sciences with UC San Francisco and UC Davis. Another effort in the Los Angeles basin draws together four Los Angeles institutions (CSULA, UCLA, USC, and UCI) in the NIH funded program in the biomedical sciences which links CSULA Master of Science programs to Ph..D. programs.

The M.S. Degree Criminalistics at CSULA is being reshaped as an interdisciplinary professional M.S. degree in Forensic Science. The interdisciplinary coursework will draw from the disciplines of biology, chemistry and psychology. New laboratory buildings will provide facilities for forensic analysis work for the LAPD, the LA County Sheriff's Office, and the U.S. Department of Justice as well as a teaching lab for CSULA.

Cal Poly SLO has a new Master of Science Program in Polymers and Coatings developed mainly to support the paint and coatings industry. The majority of students are already working in the industry and theses are designed to be completed at the work place. The M.S. in Aerospace Engineering is offered via distance technology to military and civilian personnel at Vandenberg Airforce Base.

At CSU Fullerton, the Art Department is preparing a proposal for a MA in Animation/Entertainment Arts and has sought approval from the National Professional Association during the development process.

Links to Faculty Preparation

The wide distribution of master's degrees awarded by the CSU shows they are being used not only for professional programs, in such disciplines as Social Work and Criminal Justice, but also for teaching in the California Community Colleges as well as for entrance into doctoral programs. The master's degree is the entry-level degree required for teaching in the California Community Colleges. The CSU continues to be the lead public institution in California that focuses on this degree. For potential faculty, who want to acquire a doctorate, the master's degree is often the preferred intermediate step and, again, the CSU is the public institution that delivers the majority of these degrees.

CSUS offers a Community College Faculty Preparation Certificate Program, which is administered as a self-support program. This certificate program provides critical coursework and classroom experience to prepare current and future community college instructors. Graduate level courses in general pedagogy, curriculum development, instructional communication and assessment are included (12 units of graduate level academic credit). This program is designed for matriculated graduate students who plan to obtain a master's degree and teach at the community college level.

Humboldt State's College Faculty Preparation Program is a 12 unit certificate program offering two tracks: a community college track, including a teaching internship at College of the Redwoods; and a pre-doctoral college track, including a teaching internship at HSU. This graduate certificate is available to matriculated graduate students in any discipline or for Master's graduates enrolled through Extended Education.

- **Recommended Action:** The Task Force determined that a variety of graduate level programs are needed to prepare for California's future. Bridge programs, which provide an articulated curriculum between CSU master's degree coursework and the more traditional Ph.D. coursework of the UC and private universities, are especially significant in enhancing access for students who may desire an alternative track to a "*typical*" Ph.D. education. CSU master's degree programs are encouraged, where appropriate, to develop links to and articulation with doctoral programs at UC and independent universities. Of particular interest are "bridge" programs that allow students in CSU master's degree programs to pursue a course of study with the assurance that a doctoral institution will recognize it as meeting a portion of the requirements for the doctoral degree.

PROFESSIONAL MASTER'S DEGREES

Many graduate programs in the CSU are distinguished from those in other university systems. This is particularly so with those involved in discipline-oriented research that emphasizes direct relevance to and involvement in work and social activities. These degrees are further distinguished because of their heavy involvement within a campus's region. This combination of study and community integration leads to socially relevant and immediately productive graduates. This applied study and program direction sets the CSU apart from most other institutions. The professional master's degree constitutes the largest graduate degree program component in the CSU and includes the M.S.W., the M.P.A., M.B.A., M.P.T. and the M.Ed. Many of these degree programs have strong links to professional associations, accrediting bodies, and in some cases licensure organizations.

SDSU has developed a master's degree in *Regulatory Affairs*, one of the few in the nation. It provides the biotechnology work force with advanced education in issues and processes related to the regulatory process for drug approval. Degree course work places an equal emphasis on business and science with a culminating experience being a theoretical project that has work-based applications. A significant feature of one class is assembling in Washington, DC, and meeting with officials from the FDA.

The *Master of Public Health* degree at SDSU educates health care leaders. With concentrations in biometry, environmental health, epidemiology, health promotion, and health services administration, this degree prepares health care professionals to better meet the needs of their community. The relevance of this degree is underscored by its clientele, for it attracts local and California students as well as students from the rest of the nation.

The new *Master of Engineering in Manufacturing and Design* degree is a practice-oriented, interdisciplinary degree designed to meet the needs of students interested in furthering a career in engineering with a business management emphasis. This combination produces graduates with

the skills to start or manage smaller industrial companies particularly with an entrepreneurial flair.

The Graduate Program in Public Policy and Administration at CSU Sacramento, in close proximity to the main operations of California State Government, offers a Master of Public Policy and Administration that focuses on California State and local levels of government. The proximity offers significant advantages to students in the program providing them with a ready "*laboratory*" for observing the policy and administrative issues they would confront professionally. This interdisciplinary program has strong roots in political science, economics, and social psychology.

THE PROFESSIONAL MASTER OF SCIENCE DEGREE

One of the relatively new developments in master's degree education is the professional science masters' degree program, a joint project of the Council of Graduate Schools and the Sloan Foundation. The initiative combines traditional disciplinary education in the sciences with courses at the boundary of the other disciplines. Thus, it recognizes the emerging importance of "*interdisciplinarity*". It also includes skills-based courses, such as marketing, management, statistics, skills development (e.g., writing and communication), a project-team experience and/or practical internship. The intent is to prepare graduates for careers in non-academic settings, including government and industry. This initiative is quite compatible with CSU's focus on professional and applied degrees that are responsive to regional economic development.

The *Computational Science* program at SDSU has received a Sloan Foundation award for curriculum enhancement for the Master of Science degree in collaboration with the following departments in the College of Sciences: Astronomy, Biology, Chemistry, Geological Sciences, Mathematics, Computer Science, and Physics. Real scientific problem-solving is emphasized through a thesis that could be done in conjunction with a carefully managed extramural research program. The thesis project must be interdisciplinary; graduates are prepared for positions in scientific research, scientific programming, and software engineering. The program's web site makes the following argument for the unique emphasis of this professional Master of Science orientation:

San Diego's local high technology, wireless, and biotechnology industries provide a broad and deep job market for adaptable professionals. We recognize that rapidly evolving technologies demand corresponding changes in the education of our work force. As a result, we have committed our program to providing our local and national job market with high quality trained Computational Science professionals. Consequently, our new curricula fuse scientific fields at a level of depth and complexity undergraduates would otherwise be unable to achieve; this fusion happens between computer science and relevant applications in a wide variety of scientific disciplines including bioinformatics, computational chemistry, computational algebra, scientific visualization, environmental science, scientific databases, and data mining.

Beginning in January 2003, a new master's degree in biotechnology is being offered at SJSU merging graduate level training in Molecular Biology, Immunology, and Bioinformatics with courses on the fundamentals of business offered by the off-campus MBA program. Canvassing selected biotech companies revealed an unrecognized need for science graduates with a

"*commercial*" approach toward their science. According to a publication of the College of Science:

This program will integrate advanced, hands-on technical training in core biotechnology skills with MBA-level course work. The M.B.T. program will graduate professionals, i.e., individuals who have an expressed desire to pursue careers in the biotechnology sector, with an MS in Biological Sciences, Concentration in Biotechnology. Program graduates will be able to fill a wide-open niche in the corporate biotechnology environment with training in both science and business practices.

Recommended Action. The Professional Master of Science degree is an emergent form of qualification that has important applications in certain disciplines for particular regions. The development of partnerships with business and professional communities, where appropriate, to develop new and valuable graduate degree programs should be encouraged.

JOINT-PH.D. PROGRAMS

The 1960 Master Plan for Higher Education, the Donahoe Act, in addition to mandating that instruction was to be the primary mission of the state college system, authorized the award of master's degrees and the establishment of professional programs. State college campuses were also permitted to undertake doctoral instruction jointly with the UC and accredited private institutions that offered the doctoral degree. The first CSU institution to offer the Ph.D. degree jointly with the UC was SDSU in 1965 with UC San Diego. The degree was in Chemistry. SFSU began offering the Ph.D. and Ed.D. in Special Education with UC Berkeley in 1968. CSU campuses participate in a number of joint doctoral programs with UC including programs in Special Education, Math and Science Education, and Educational Leadership. A larger number range across the disciplines and include Biology, Chemistry, Ecology, Clinical Psychology, Geography, and Public Health. During the decade from 1990-2000, the joint programs graduated 281 doctoral students.

In addition to existing joint-doctoral degrees, a new program in audiology with SDSU and UC San Diego has been approved and is going forward as is a joint Ph.D. program in Evolutionary Biology with SDSU and UC Berkeley. SFSU and UC San Francisco are also going forward with a doctorate in Physical Therapy. A joint-program in Public History between CSU Sacramento and UC Santa Barbara has recently been approved.

Recommended Action. The joint Ph.D. programs provide exciting opportunities for faculty and students of the CSU and UC to share in dynamic programs, with settings for collaborative research and teaching. These efforts have generally relied on the persistent commitment of time and energy of individual faculty from both institutions. The timelines for approval have been lengthy. Though valuable, the completion of 281 degrees from 14 programs in a 10-year period (1990-2000) points to the limits of these programs for rapidly developing program areas. It is recommended that continued support for the joint-Ph.D. programs be continued. The CSU is urged to study further the experience of the existing programs to determine the most useful practices for future joint work, with a special focus on faculty workload. Start up funding has not been consistently available for these joint efforts. We recommend funding and support for Joint PhD comparable to that provided the Joint CSU-UC Ed.D Program (see below).

THE JOINT-ED.D.

In the fall of 2001, Richard Atkinson, the UC President, and Charles Reed B. Reed, the Chancellor of the CSU, signed a memorandum of understanding (MOU) that committed the two systems to the development of collaborative education programs leading to an Ed.D. degree to be offered jointly beginning in the fall of 2003. Early joint-doctoral (as noted above) programs were generally limited to ventures between departments of one CSU and one UC campus and generally involved a long developmental and approval timeline. Although each individual partnership generated different *"revenue sharing"* practices during the course of the program evolution, there was no parity in terms of faculty workload or funding between the two systems.

The MOU included a number of areas of agreement that can be viewed as principles to guide future collaborations. The initial implementation efforts also suggest additional directions for future partnerships. Together there is an excellent opportunity to benefit from the learning that has occurred during the early phases of the joint-Ed.D programs involving the CSU and UC.

One "new" principle is that fees and marginal cost funding for joint- Ed.D. programs are collected at the UC rate. That allows for a richer funding formula for the CSU than other joint-doctoral programs collecting fees and being funded at the CSU rate. Another key principle of the MOU is parity – fee sharing, sharing of FTES, supervisory credit, shared curriculum development and approval processes, and "*workload parity*". Efforts to plan administrative and implementation activities has led to several challenges and opened up some new possible approaches. "*Total program workload*" is a concept which includes not only the teaching workload but also advising, qualifying and oral examinations, dissertation supervision, seminars and directed study, and internships.

The need for collaborative curriculum development and approval processes has generated significant discussions among the faculty of the two systems. In particular, the CSU faculty has explored different mechanisms for achieving *"parity"* in the review and approval process, in large part because it does not have a statewide curriculum approval body that is comparable to the Coordinating Council for Graduate Affairs (CCGA). A short-term solution has included an expansion of the UC's CCGA process to include a CSU faculty member as a formal part of the review team, which presents recommendations to the CCGA. The ASCSU has established a subcommittee (to include members of the Academic Affairs Committee and the Teacher Education and K-12 Relations Committee) to select CSU faculty reviewers.

Recommended Action. A subcommittee of the Academic Affairs Committee of the CSU should be formed specifically to consider policies and practices in the joint programs. The commitment to "*parity*" in workload and dissertation supervision as well as academic design is paramount and requires the ongoing oversight of the Senate.

SUMMARY

The CSU is providing a wide continuum of educational programs at the graduate and post baccalaureate level. These range from graduate certificates which provide opportunities for modules of advanced education in specific areas of professional and economic need in its regions to regional and statewide joint-doctoral program agreements between several CSU campuses and the University of California. These high quality programs provide critical skills to the regions and people of California. The educational needs of our society and our economy will not be met

and the expansion of opportunities for our citizens and our economy will not happen without the investment in our system of graduate education.

CONSTRAINTS AND COSTS IN MEETING THE NEEDS

This discussion of constraints and costs is built on the understanding that graduate and undergraduate instruction and programs differ in fundamental ways. Dinielli (1989) reported the required basic elements of a quality graduate program included as Appendix A of this report,. It is the only section of the report accepted and affirmed by the CSU Board of Trustees; thus it contains the definitions of the basic elements of quality graduate programs expected within the CSU.

Two of the report's central recommendations focused on the workload of faculty teaching in graduate programs and on a funding differential for graduate education. Neither of these recommendations has been implemented but both are crucial for delivering quality graduate and postbaccalaureate education in the CSU.

GRADUATE WORKLOAD

Although it is general knowledge among graduate faculty, it is worthwhile to consider again the workload factors associated with quality graduate program implementation and instruction. These factors and activities do not exist in the conduct of CSU undergraduate programs. The following are some of the tasks to be incorporated into quality graduate programs (as accepted by the CSU Board of Trustees).

1. Thesis exploration.
2. Thesis direction
3. Thesis committee work.
4. Demonstration of each student's oral and written communication skills.
5. The supervision of integrated internships and practica.
6. The provision of a culminating experience.
7. Review of student applications and student selection.
8. Monitoring individual student progress.
9. The training of graduate students for teaching.
10. The provision of extra academic resources (e.g., library, technology, research facilities).
11. Recruitment of potential graduate students.

These activities represent additional responsibilities for graduate program faculty and may not be recognized by others in the University. Their excessive demands are largely met by faculty members' kindness, goodwill, and professional pride, characteristics that extend their work activities beyond undergraduate faculty workload expectations. The demands are extended further when it is realized that graduate program involvement is not shared among all members of a department, but rather, by a subset of faculty interested in or committed to graduate offerings.

Table 3 illustrates the demands placed on a faculty member purely by thesis work based on an 8-hour workday. It is predicated on the generous assumption that a thesis takes one semester to complete.

Table 3. Graduate Thesis Tasks, Work Involved, and Overall Workload Requirements per Week Per Semester/Quarter.

Graduate Program Task	Work Units Per Semester/Quarter	Total Weekly Workload Demand on a Single Faculty Member
Thesis chair	4 students, each @ 2 hours/week	1 day/week
Exploration of a thesis topic with a student	6 students, each @ 1 hour/week	.75 day/week
Thesis committee member	8 committees, each @ .5 hour/week	.5 day/week

The total thesis load in Table 3, which involves finishing, continuing, and initiating theses, requires 2.25 days/week of work. Even with a 50% reduction in the work quantities described, the extra demand of thesis work alone still encumbers more than one extra day of work per week. Other graduate program demands add further to this amount. This workload needs to be recognized as part of the teaching load of graduate faculty with compensating course load reduction.

Given these extra responsibilities, how are graduate programs accommodated? When graduate activities and duties are substituted for undergraduate involvement in a faculty member's workload, there is a trade-off, but still an overall increase in faculty workload because of the greater demand of every graduate activity.. A faculty member's excessive graduate duties usually depreciate the quality of contributions to both graduate and undergraduate programs. Program quality is threatened at any level when a faculty member has too much to do.

The main thesis of quality graduate work in 1989 (Dinielli) is as relevant today as it was then. The Board of Trustees endorsed the earlier prescriptions for quality programs. Consequently, most CSU graduate programs are now conducted according to the defined and accepted practices and constructs. That implementation has caused a differentiation between graduate and undergraduate faculty roles and functions. Graduate faculty must perform more work and provide more services per student than in undergraduate programs. While that extra work is expected of CSU faculty, it has not been accompanied by compensation in workload or differential funding. This is but one more indication that CSU faculty perform more work for less funding and compensation than in comparable institutions.

Because of distinct characteristics and demands, faculty functions and participation in graduate programs need to be recognized. Substantial and significant factors separate graduate and undergraduate programs. Those differences warrant separate workload descriptions and differential funding. At the same time, graduate students play an incredibly important role in serving as role models for undergraduate students.

Recommended action: It has been argued that these workload distinctions suggest the value of a separate Graduate Faculty. While the Task Force did not support that as a systemwide solution, it is recommended that each campus discuss this issue to determine the appropriateness of a separate Graduate Faculty as a way of organizing and recognizing workload. As part of the campus discussions it is recommended there be an examination of the expectations of faculty who teach at the graduate level and any special qualifications for those faculty members.

FUNDING GRADUATE AND POSTBACCALAUREATE PROGRAM QUALITY

The California Department of Finance argues that the current single marginal cost/funding formula for FTES understates graduate education and overstates undergraduate education costs resulting in a single amount that is a *"reasonable balance"* between the two. However, the amounts involved in this compromise are negotiated, and no longer data-based. CSU student funding is not based on objectively determined need costs. This simple model devalues graduate education because it fails to consider the extensive unique and demanding factors involved in its provision. Graduate programs contain different and more demanding work procedures than do undergraduate programs.

The single marginal funding formula is oriented to undergraduate instruction, the major demand on CSU resources. In the CSU, it has been persuasively argued (see Academic Senate resolutions) that the marginal funding amount is even inadequate for undergraduate program support. Consequently, to address funding needs of graduate programs, it is important to reiterate the proposal in the earlier CSU Graduate Report (1989). .

> *The recommended instructional workload for those with significant responsibilities for graduate instruction should be reduced. The California State University should seek funding to implement this workload provision. Budgetarily, this could be accomplished by changing the definition of a full-time equivalent graduate student to 12 Student Credit Units instead of the current 15, by negotiating an increase in the weighting assigned to graduate course units, or by adjusting the normative ratios by which faculty positions are generated for graduate instruction. (p. 55)*

This Task Force contends that CSU graduate education is under-funded. When a campus allocates resources, there normally is no real consideration of the work differences between graduate and undergraduate programs with an according apportionment of differential funds. This leads to the following recommendation.

Recommended Action. The current single marginal funding amount provided for both graduate and undergraduate FTES should become the undergraduate marginal funding cost (FTES). Graduate programs in the CSU should receive a different marginal funding amount. That amount should be 125% of the undergraduate amount per *FTEGS* (Full-time Equivalent Graduate Student). Reducing the definition of a full-time equivalent graduate student to 12 Student Credit Units instead of the current 15 will achieve that outcome.

This recommendation is a reaffirmation of the 1989 proposal. It is the very least amount required to support graduate instruction in 2004.

- It should serve as a temporary starting point for correcting inequities for graduate program expectations within the CSU.
- As the importance of graduate programs continues to grow in California and in society, the costs of programs will continue to increase. Thus, the student credit unit reduction (125% FTES) to produce the FTEGS should serve as the base marginal cost for graduate education in the CSU at the commencement of this initiative.
- A mechanism for the growth of the FTEGS in future years, with the intention of eventually providing funding necessary for quality graduate programs, should be incorporated into the funding decision procedures of California for the CSU.

There is some value in institutions receiving one undifferentiated amount of funding to cover both graduate and undergraduate programs. One benefit is that each institution can decide how much to spend to support graduate and undergraduate programs. [Some institutions already do this, but the amount that is *"carved up"* is not as equitable as it could be.] It would be an autonomous internal decision for each campus. The balance between undergraduate and graduate programs would reflect an institution's unique programmatic character. Considerable bureaucracy would be retrenched if this responsibility were given to each institution.

Another benefit would be the more equitable dispersion of total CSU funds. Currently, institutions with very small graduate programs receive a greater amount per undergraduate student than do campuses with large graduate programs. This stems from the overestimate of undergraduate and under-estimate of graduate program costs described in the opening paragraph. This model only requires one decision of the state government: accept the counting of a graduate student as being 125% of the cost of the single marginal cost amount. It is a simple solution.

SELF-SUPPORT AND THE GENERAL FUND

In contemplating the diversity of postbaccalaureate education programs within the CSU, consideration was given to the variety of funding options including what is termed self support. This includes programs administered through continuing education and supported by student charges in addition to general fund support programs normally located with academic departments. In recent years, there has been some exploration of various hybrid programs where common programs may be supported by separate revenue streams. *The Cornerstones Report* urged greater experimentation with such options in its 1997 report. University policy, primarily linked to enrollment audit concerns, has emphasized that a firewall must exist preventing blended funding streams. These cautions may have created an unfortunate reluctance to continue the exploration of alternate funding models.

Mixed funding models may afford opportunities to create incentives for more faculty to teach in postbaccalaureate programs. Students may also be willing to pay fees higher than general support for a faster paced program with a higher level of student service support. As an example, the approximate Student Fees for General Fund supported M.B.A. are $9,000. The approximate Student Fees for Executive (self-support) M.B.A. are $26,000, while the costs for a student in a modified or hybrid program might run to $17,000.

Recommended Action. Continue exploration of alternate hybrid models for providing graduate education which blend general fund and self-support funding and curricular support, but which are attentive to auditor concerns about fund accounting.

INVESTING IN THE RESEARCH INFRASTRUCTURE

In spite of the CSU's contributions to research, very little funding has been allocated by the state in support of faculty scholarship. Almost all the support has been directed to instructionally related activities rather than research. Funds provided by the CSU system for research average less than $200/FTEF per year. This level should be increased to a minimum of $1,000/FTEF per year and should be viewed as a very modest investment in the economic future of the State.

In January 2003, the CSU Board of Trustees adopted the CSU Federal Agenda for 2003, which included an item proposed for proactive pursuit linked to the current reauthorization of the Higher Education Act. That item committed the following:

The CSU will advocate broadening the federally supported research base to include more support for comprehensive universities, including in programs outside the HEA.

The CSU federal agenda also included a commitment to seek support in relevant appropriations committees for 60 research projects from all members of the California Congressional Delegation. Many of these projects are interdisciplinary and/or multi-campus efforts. It is noted that several of these projects demonstrate the vitality and diversity of CSU research efforts and justify the need for ongoing support in the development of necessary research infrastructure. Three examples are listed below.

- The *Agricultural Research Initiative* is a multi-campus initiative supporting high impact applied agricultural and related environmental research, development, and technology transfer, as well as public and industry education and outreach.
- The *California Consortium for Applied Genomics, Bioinformatics, and Information Technology* is a multi-campus initiative to enhance applied research in microbial defense areas, develop collaborative research programs, support development of education programs in the fields of epidemiology and microbial sciences, train emergency personnel, and garner resources leading to the development of new antibiotics to treat bioagents.
- The *California Center for Integrative Coastal Research* is a multi-campus coastal research initiative that will provide real-time access to extensive environmental data to regulatory agencies responsible for the development and enforcement of management policies.

Recommended Action. Persist with the aggressive advocacy of federal support for research funding. Partnerships with private universities that would enhance the CSU's research infrastructure is also encouraged. Funds provided by the CSU system for research average less than $200/FTEF per year. This level should be increased to a minimum of $1,000/FTEF per year and should be viewed as a very modest investment in the economic future of the State.

SUMMARY

The full potential of the 23 campus CSU network will be achieved only by systematically addressing the resource/funding issues and internal policy barriers discussed in this section of the report.

MEETING FUTURE NEEDS

Although the CSU is well recognized as the major provider of California workforce needs, it has not yet been acknowledged as a major force for economic prosperity. Thus, it is important for the CSU to develop a strategy that highlights the potential of applied research programs that are a part of its graduate education and link them to future regional prosperity.

SCHOLARSHIP OF APPLICATION: A VISION FOR THE CSU SYSTEM

Faculty members in the CSU have been recognized in all forms of scholarship. However it is in the scholarship of application (B**oyer, 1997**) where CSU faculty members have made a significant and, within California, largely unique, contribution of new knowledge. This type of scholarship is characterized by context-dependent rather than open-ended research. Many CSU research activities have focused on application and social and economic development in the state. This has been a natural consequence to the regional nature of the academic mission of the CSU.

The scholarship of application is an appropriate niche that emphasizes research in the context of state social and economic developments and hence, serves to distinguish the CSU. This vision is consistent with the mandate of the CSU to meet regional workforce and economic development needs.

There are many examples that illustrate the contributions of the CSU to regional development in California. Many campuses have been recognized for regional development through applied research in health sciences, information technology, marine sciences, microelectronics, and manufacturing technologies. The CSU graduate students and faculty have played a leading role in the social, public and cultural life of California.

The changes in the economic mix in the state and the growth in technology and health-related sectors require greater investment in applied research that targets programs for local and regional development. The CSU system is well suited to assume this responsibility. The Table 4 provides an understanding of the increased contracts and grant activity which supports applied research illustrating the growth in the volume of grant and contract awards to CSU campuses and their faculty and graduate students between 1993 and 2002. Contracts and grants revenue almost doubled in six years, from $240,787,200 in 1993/94 to $457,231,284 in 1999/2000.

Table 4. Growth of Grant and Contract Work in the CSU.

Year	Contracts	Grants
1993/94	240,787,200*	
1994/95	66,610,206	199,886,236
1995/96	87,129,519	199,733,314
1996/97	101,405,096	188,169,095
1997/98	89,737,070	204,935,037
1998/99	189,438,796	259,947,848
1999/2000	184,442,840	272,788,444
2001/2002	261,354,916	298,016,360

*Combined contracts and grants

Sources:

Board of Trustees Agendas (Committee on Institutional Advancement):

- January 28-29, 2003, Agenda Items 3, 4
- January 29-30, 2002, Agenda Item 1
- January 23-24, 2001, Agenda Item 2
- January 25-25, 2000, Agenda Item 3
- January 26-27, 1999, Agenda Item 3
- January 24-25, 1995, Agenda Item 2
- CSU Special Review Summary, 1995-1996
- CSU Special Revenue Report, 1994-95

Current Ph.D. programs in California are focused on two major goals: the preparation of qualified graduates for careers in higher education at the national and international levels, and; an emphasis on the scholarship of discovery and advancement of the frontiers of knowledge.

During the last ten years, there has been a shift in sources and thus focus of research funds. An increasing proportion of funds is being provided by the corporate sector and private foundations that focus on applied research and project-based activities. At the same time, there has been a steady migration of strategic research programs in some fields from academic institutions to corporate research centers. Those centers tend to emphasize focused research programs that directly serve strategic business goals and ensure competitive advantages. Many businesses often need to employ researchers qualified to conduct investigations that are constrained to the specific needs of the company. Similar needs exist in other regional development centers and many government organizations. Graduates from traditional Ph.D. granting institutions often lack preparation for such applied research.

FUTURE DIRECTIONS

REFORM INITIATIVES IN DOCTORAL EDUCATION NATIONALLY.

At this beginning of the 21st Century it is increasingly apparent that there is a significant, perhaps pivotal, re-examination of doctoral education in the United States. In recent years, noteworthy initiatives have challenged the very foundation of the ways in which doctoral students are prepared and the careers for which they aspire. Some examples below are provided as a context for the evaluation of the role of the CSU in preparing doctoral students for California's future.

The Ph.D. has long been valued as the *sine qua non* of graduate degrees. Yet, there is much current speculation about its continued vitality and versatility in contemporary society without

reinvigoration and transformation. For example, the *Carnegie Initiative on the Doctorate* is a multi-year project intended to support doctoral-granting institutions in their efforts to purposefully structure the doctoral experience. Departments are expected to commit to the goal of "*adapting doctoral education to the demands and needs of the new century by assessing current practices and crafting an enriched vision.*" (*www.carnegiefoundation.org/CID*) The *Responsive Ph.D. Initiative* organized by the Woodrow Wilson National Fellowship Foundation, with a grant from the Pew Charitable Trusts, is intended to provide a model for innovation and change. Focal areas for the *Responsive Ph.D. Initiative* include encouraging interdisciplinarity, the development of scholarly citizenship, rather than simply replenishing the professoriate, professional development for careers within or outside higher education, pedagogical training for effective teaching with varied audiences in diverse civic, cultural, business, educational, and scientific venues, and reaching out to populations underrepresented in the current professoriate (*www.woodrow.org/responsivePhD*).

Among the first reform initiatives aimed at modifying traditional Ph.D. education and training was the *Preparing Future Faculty* (*PFF*) program funded by the Pew Charitable Trusts, the National Science Foundation, and the Atlantic Philanthropies. This initiative was founded on the basis of studies indicating that a new vision for doctoral preparation was worthwhile; specifically, that graduate students needed to know much more about the nature of the profession for which they were preparing, including expectations for faculty performance in teaching, research, and service and in different types of institutions in higher education. In addition, students need more information about potential careers outside the academy, better mentoring from faculty, and a clearer understanding of the full range of professional work. Most recently, *PFF* has joined with various disciplinary societies to develop model *PFF* programs in academic departments. The *PFF* web site (*www.preparing-faculty.org*) contains information on existing programs and a list of publications and resources.

Also receiving Pew funding, the *Re-envisioning the Ph.D. Project* housed at the University of Washington has become a valuable clearinghouse for gathering and disseminating studies, essays, and analyses of the reformation of doctoral education. The use of the *Re-envisioning* web site has steadily increased. In October, 2002, the site received 270,000 hits and the original study "*The Ph.D.: What Concerns Do We Have?*" was downloaded more than 40,000 times. (*http://www.grad.washington.edu/envision/*). Nyquist (2002) summarized current national reformation initiatives and the goals behind them. She wrote: "*The Ph.D. was not 'done wrong'; in fact, it has been done magnificently. But changes in society create new requirements, and we need to honestly assess the efficacy of the Ph.D. now to ensure that its recipients continue to make the kinds of contributions in the public and private spheres that the nation needs to remain strong*" (p. 14). Numerous studies of doctoral education reform agree that doctoral education should do the following: "*match the aspirations of doctoral students; respond to the needs and demands of a changing academy, broader society, and globalization; provide systematic, developmentally appropriate supervision and opportunities for professional preparation for a variety of careers within the academy, and for a rich array of career options outside of academia; increase the retention rate of doctoral students; educate more minorities and women in some fields; encourage more creative and adventurous research and interdisciplinarity; and, limit the open-ended nature of time-to-degree*" (p. 15).

Taken together these various initiatives and the studies upon which they are based provide us with an emerging but increasingly clear picture of the future of doctoral education at the

beginning of the 21st century. Doctoral education in the United States, and American graduate education in general, thrived for over 100 years and has been tremendously successful in educating successive cohorts of professionals and in promoting research that has transformed US society. To remain vital, graduate education must continue to evolve new models and approaches to teaching, learning, and scholarship. Graduate degrees need to be responsive to changing social needs while maintaining the traditional standards of rigor and excellence. In the years ahead, doctoral education could be more inclusive and demographically diverse with enhanced access to members of traditionally underrepresented groups. It could become more intellectually and disciplinarily diverse as new fields emerge through interdisciplinary inquiry. Doctoral recipients are likely to be more broadly educated, trained, and mentored in various teaching strategies and research methodologies that apply to more diverse student populations, educational institutions, and research and practice settings. At the same time, more applied and practice-oriented doctoral programs will likely be developed in response to social needs and the aspirations of doctoral graduates to work in non-academic settings. Stakeholders in graduate education have become more diverse. Nyquist noted, research institutions are no longer able to claim sole "*ownership*" of the doctoral degree as professional societies, national organizations, government and private agencies, and other institutions are becoming more influential (Nyquist, 2002, p. 14). Given its historical emphasis on access to higher education, student-centered learning with dedicated faculty mentors, excellence in teaching, and applied, community-based research and professional practice, the CSU has much to contribute to doctoral education in California in the 21st Century.

THE ROLE OF THE CSU IN DOCTORAL EDUCATION IN CALIFORNIA IN THE 21ST CENTURY

The CSU is currently involved in doctoral education in California and has been for some time as noted previously in offering joint-doctoral degrees and the more recent joint-Ed.D. degrees. While this thirty-year history of providing doctoral education to Californians has depended mainly on positive collaborations with the UC, most recently in mounting the joint UC/CSU Ed.D. programs, there is little doubt that the 1960 Master Plan has severely inhibited the CSU's ability to offer doctoral programs. Although it is the largest system of public higher education in the nation, the CSU issued only 40 doctorates in 1999-2000 compared with the 2,729 issued by the UC (Alarcon, 2000).

As the Alarcon report noted, the UC is not keeping pace in the production of doctoral degrees. While its number of undergraduate degrees increased by 17% over the past decade, production of all graduate degrees, master's, doctoral, and professional degrees combined increased by only 4.4%. On the other hand, independent colleges and universities filled the doctoral gap by awarding 49% of the doctorates conferred in California in 1999-2000. The number of doctorates produced by such institutions grew by 47% over the past decade (Alarcon, p. 20).

These data have noteworthy implications for the diversity of the graduate student body in California. A hallmark of the CSU system has been its provision of access to higher education for members of traditionally underrepresented or economically deprived groups. To the extent that publicly funded graduate education in general, and doctoral education in particular, is unavailable, such groups will continue to be disadvantaged relative to those who can afford more costly private education. Their future rests only with public education and institutions. The Alarcon report noted:

> *It matters that California's graduate institutions in an era of historic diversity strive to bring more students from all backgrounds into their classrooms. Graduate education is no longer a*

> *purview of the historic elite but, increasingly, a logical pathway for those committed to pursuing goals tied to knowledge. Given the stakes, it becomes a responsibility of colleges and universities to encourage more students to begin thinking of themselves, perhaps for the first time, as graduate material* (Alarcon, p. 30)

The ASCSU has also recognized the importance of the CSU in offering graduate education in California. As noted in its recent *21st Century report* (Cherny, 2001).

> "*Thus, any strengthening of graduate education in California must centrally address the serious needs of the CSU. The CSU could do more to meet the needs of California residents for postbaccalaureate education, including non-degree programs, the expansion of existing masters' degree programs, and the introduction of new, applied graduate degree programs at the master's and doctoral levels"* (p. 17)

The report goes on to note that expansion of postbaccalaureate programs should be based on the capability and financial feasibility of the CSU to offer such programs. Those issues will be addressed in the next section and this report's recommendations.

The CSU can build on its niche of applied scholarship and pursue a different kind of Ph.D., an applied doctorate that prepares graduates for careers that emphasize context-dependent research rather than open-ended research. There are regions in the state, such as Silicon Valley, that experience a growing need for this type of graduate. All indications seem to confirm that this trend will intensify and continue to grow for the foreseeable future. Another important point to emphasize is that most master's programs in the CSU system are centered on applied and professional areas. These programs can serve as natural feeders to *applied doctorates*.

Applied doctorates:

- are more applicable in technical or professional fields;
- are driven by the need for research and development in industry or the corporate community rather by the need for faculty in higher education;
- involve applied rather than basic research;
- are more relevant to social and economic development; and
- contribute to workforce and economic developments as well as academic growth.

APPLIED DOCTORAL DEGREES

Assessing the need for a doctoral program is more complex than might appear at first glance. Except in a few fields that are closely related to health and safety and that are subject to licensing or certification requirements at the doctoral level, there is rarely a perfect match between a doctoral program and a category of employment into which nearly all graduates would gravitate.

Where there is a good match, one could use data and forecasts compiled by such agencies as the Bureau of Labor Statistics (US Department of Labor) and the California Employment Development Department to estimate job openings in the next few years. One would need to take into account the impact of population growth, retirements and other departures from employment in the category, changes in relevant technology, changes in regulations governing how the work is accomplished, and other factors peculiar to the category. One could then compare the

productivity of current doctoral programs with employment opportunities to provide an estimate of program need.

Even in such cases, it would be important to ask:

- whether the need is nationwide or particular to certain regions;
- if there are emphases or sub-specializations for which the need is especially acute;
- whether existing doctoral programs provide education that is well-suited to non-university employment opportunities; and
- to what extent existing programs could accommodate doctoral aspirants who are mid-career, place-bound working professionals.

For many professional and applied fields, there is no readily identifiable employment category that can be matched to a doctoral program. In some fields there may still be a few positions outside universities for which a doctoral degree is a *necessary* qualification. However, the demands on practitioners have increased to the point where relatively advanced levels of practice and leadership positions require more fully developed skills and knowledge than can be acquired in bachelor's and master's degree programs. The environment within which the practitioner acts may now be more complex than it once was. Contemporary practice may involve the selection and deployment of a greater range of sophisticated tools, both tangible and intangible, and sufficient understanding of complementary professions that enable the practitioner to collaborate effectively with colleagues in those professions. Problem-solving may require the use of strategies -- including data collection and analysis -- previously associated more with fundamental research than with practice. Practitioners in most professional fields are routinely expected to continue learning as they work, but that learning is likely to be piecemeal and specific to immediate challenges. A doctoral program could be structured to promote the integration of work experience and new knowledge and skills and thus raise a practitioner's overall level of functioning.

In evolving fields, job openings in California for which a doctoral degree is required may be a poor guide to the need for doctoral programs. In some areas, most doctorate-degree practitioners may function, formally or as consultants -- in positions for which it may be especially difficult to identify what constitutes a job opening. The relative paucity of doctorate-degree practitioners may discourage employers from mentioning the doctoral degree in job advertisements, for fear of restricting the applicant pool. Some non-university employers may ignore a doctoral qualification because they see existing doctoral programs as focusing more on basic research and less on content likely to enhance practice. Indirect evidence of need -- for example, high employment rates in the profession for doctorate-degree practitioners outside of California where there is readier access to applied doctoral education -- may have to be given greater weight.

A number of fields show promise for successful development of applied doctorates within the CSU. A group of programs, representative of the diversity of possibilities but by no means an exhaustive list, follows. Possibilities also exist in other areas including business administration, nursing administration, and social work.

COMMUNICATION STUDIES DOCTORATE

Only two programs in California offer the doctoral degree (research-based) in communication studies. One of those programs is at the University of Southern California (USC) and is affiliated with the Annenberg School of Communication West on the same campus. The other doctoral

program is at the UC Santa Barbara (UCSB). Both programs are in southern California and only one is in a state institution. While the program at USC takes a critical approach in applied rhetoric, the contrasting program at USCB is social scientific in that it focuses on quantitative methods and empirical investigations of communication phenomena. Students who do not find either program appropriate must leave to gain their education. Graduates seek careers in both academic and non-academic arenas in a broad array of disciplines.

The CSU has graduate faculty well qualified in research in communication studies programs that could work with UC faculty to create and offer a joint-doctoral program. CSU faculty belong to the same professional societies and national associations, and their publications are in the same refereed journals as those of their UC counterparts.

PHYSICAL THERAPY DOCTORATE

Nationally, the preferred degree in physical therapy is now the Doctor of Physical Therapy (D.P.T.). All private schools in California have been approved or have already moved to the Doctorate entry-level program. As of August 2002, 61 programs are accredited at the D.P.T. level, five new programs are being established at the D.P.T. level, and an additional 85 programs have expressed their intent to change to the doctorate. Most of these programs anticipate making the change within 2-3 years. If that is the case, 75% of the programs in physical therapy will be at the doctorate level. The speed with which the transition from the M.P.T. to D.P.T. is progressing is quite remarkable. In California, all private sector institutions have either made the transition or are scheduled to make the transition by Fall 2003. Nationwide, many of the programs offering the doctorate are located in public sector institutions; a specific list is available on the *APTA.org* web site.

The Department of Physical Therapy at CSULB has taken two routes in determining the feasibility of establishing the D.P.T. They have participated in a number of informal meetings with other CSU campuses that offer professional physical therapy programs. They include CSU institutions in Fresno, Northridge, and Sacramento, and UC San Francisco/SFSU. The UCSF/SFSU program was approved to offer the D.P.T.Sc. degree effective Fall 2002. This program is a post-professional degree designed to prepare physical therapists pursuing a teaching career or clinical research. In addition, they have submitted a proposal for an entry-level D.P.T. for possible implementation in Fall 2003.

EDUCATION DOCTORATE

The nature of educational leadership is rapidly evolving. The responsibilities of leaders have "*deepened and broadened*."[1] Mandated state-wide accountability and testing systems require that administrators and teacher-leaders have much more sophisticated skills in data collection and analysis as well as the ability to use this information in reshaping curriculum and pedagogy to meet more challenging standards. California occupational projections from the Bureau of Labor Statistics for 1998-2008 showed an expected increase in demand for educational administrators of 21%. Increased demand for teachers at various levels ranged from 19% to 72%. A California Postsecondary Education Commission (CPEC) study found that public school district superintendents "*surveyed frequently mentioned that there exists a need for doctoral programs that emphasize a practical knowledge base, including such areas as instructional methods, school finance, the politics of education, statistical analysis methods, school law, and project*

[1] EdSource. (2001). *Help Wanted: top Administrators to Lead California Schools.* p. 2

management."[2] The CPEC study also found that "*in 1998, there was 14,685 K-12 students for every doctorate produced in California compared to 9,438 in the nation.*"[3] Similarly, the number of doctorates per 1000 administrators in California is 91 where as in Pennsylvania it is 173.

> *A first indication of the demand for the Ed.D. in Educational Administration and Leadership in the region is found in the numbers of applicants to the UCI/UCLA program. In spring 2002, there were 80 applicants for a cohort of 16 students. More than 30 of the applicants had excellent qualifications. The applicants' interests were spread among leadership in K-12 education, higher education, and educational technology. Applicants were from throughout the Los Angeles Basin and Orange County and included individuals from numerous Los Angeles school districts and from Long Beach and the surrounding area. This pattern is consistent with that of the past four years. The UCI program has consistently had from three to four times as many applicants as it can admit. Its applicants have been individuals in leadership positions throughout the greater Los Angeles and Orange County regions, and their interests have been in K-16 educational leadership, including leadership of urban schools, community colleges, 4 -- year colleges, and educational technology.* CPEC Study

Between March and May 2002, CSULA, CSULB, CPP, CSU Fullerton, and UCI jointly undertook a survey designed to assess the demand for an Ed.D. in Educational Administration and Leadership in the Los Angeles and Orange County regions. The survey included administrators throughout the greater Los Angeles and Long Beach areas and students in CSULA, CSULB, CSU Fullerton, and CPP master's degree programs. More than 600 responded to the survey. Approximately 80% of the respondents indicated that they were very interested or somewhat interested in pursuing doctoral studies in education. More than 85% indicated their preference for a doctoral degree program would be one offered jointly by a UC and a CSU campus near their home or work. The survey results indicated: K-12, community college, and higher education leaders expressed significant interest in preparation at the doctoral level for educational leaders. The populations this doctoral preparation would serve showed strong interest in a joint-doctoral program between UCI and CSULA, CSULB, CSU Fullerton, or CPP.

FORENSIC SCIENCE DOCTORATE

Options for this doctorate are:

- Doctor of Philosophy (Ph.D.) in Criminal Justice.
- Doctor of Criminology (D.Crim.).
- Doctor of Philosophy in Public Administration concentrating in Criminal Justice.
- Doctor of Philosophy in Sociology concentrating in Criminology.

The criminal justice programs (criminalistics/forensic science, criminal justice administration, criminal justice-corrections, and criminology) offered through the CSU generally include coursework that examines crime, crime control, the justice process, and justice institutions through multidisciplinary perspectives. While each campus has a unique program, course offerings generally span the entire system of justice administration in both public and private sectors. Many graduates secure positions with various federal, state, and local criminal justice agencies.

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[2] CPEC. (2000). *The Production and Utilization of Doctorates for Administrators in California's Public Schools. p.6*
[3] CPEC. P. 16

Fourteen CSU campuses offer undergraduate degrees in some type of forensic science discipline (criminology, criminal justice administration, etc.). In addition, CSU Los Angeles, Sacramento, San Bernardino, San Jose, and Stanislaus offer a graduate degree (M.A. or M.S.) in various areas within the discipline. One could expect that many of these graduates would be interested in pursuing advanced degrees (J.D. or Ph.D.).

At CSU Los Angeles, the new crime lab building will also house the crime labs for LAPD, LA Sheriff's Department, and the U.S. Department of Justice. In addition, it will have a teaching lab for the CSULA Department of Criminalistics. At present, its M.S. degree in Criminalistics is being reshaped as an interdisciplinary professional M.S. degree in Forensic Science (with Biology, Chemistry, Psychology). Part of CSULA's long range planning is based on the vision that the facility would be an ideal research location to support a doctoral program in Forensic Science.

Recommended action. It is timely for the CSU to develop a strategy for applied doctorates that emphasizes the scholarship of application. The strategy needs to include a careful assessment of the regional need for such degrees and whether they can be offered independently or jointly.

SUMMARY

Future needs for graduate and post baccalaureate education in California are naturally linked to the strengths and potential capacity of the CSU. Current graduate degrees and faculty expertise exist in the fields of needed growth and expansion. Continued growth of the professional master's degree programs, including professional master's of science work, must be coupled with a serious examination of the possibilities for the CSU to be granted authority to offer stand-alone applied doctorates in areas of public need.

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APPENDIX

RECOMMENDATIONS FOR GRADUATE PROGRAM QUALITY FROM THE DINIELLI REPORT (1989)

The following recommendations are those contained in the original *Dinielli Report* (1989; Chapter 3 *The California State University Master's Degree: Implementation and Quality*). The detailed explanations accompanying each recommendation have not been included. This is the only section of the report accepted by the CSU Board of Trustees.

The issue of program quality is the crucial element in the review of California State University master's degree programs and the touchstone by which nearly all other issues should be judged. Program quality is best evaluated in terms of the product: that is, in terms of the added knowledge and abilities of the graduate. A student in a graduate program of quality should acquire:

- a professional approach to the discipline;
- a balance of training between theory and practice, as appropriate for the discipline;
- the ability to think holistically about the discipline;
- intellectual curiosity about the discipline;
- the ability to derive intellectual satisfaction from the discipline;
- the ability and desire to synthesize and integrate within and across disciplines, along with the understanding of the necessity and relevance of so doing;
- the desire and ability to extend the knowledge within and beyond the boundaries of the discipline; and
- the ability to do independent work.

Such programmatic outcomes are not easily measured. Operational indicators, however, provide more readily determined criteria. What follows is a set of operational guidelines that the Advisory Committee proposes as conditions necessary for graduate programs of quality and appropriate to the CSU.

Recommendation 1 (p. 16)

To support the goal of quality in graduate education, the CSU Trustees and each campus should adopt the following criteria for quality in graduate programs and should incorporate them into procedures for reviewing proposals for new as well as existing programs:

Graduate programs of quality in the CSU require:

1. An institutional infrastructure that provides:
    - appropriate standards and processes for admission, continuation, and graduation;
    - adequate facilities and resources (including library and information technologies) to conduct graduate work and research at an appropriate level and in an appropriate and timely fashion;
    - recognition of the need for appropriate teaching loads, resources for research, opportunities to maintain professional and pedagogical currency, and opportunities for renewal for faculty who teach graduate courses;
    - a scholarly environment providing such support programs as visiting lecturer series and faculty seminars.
    - appropriately qualified faculty to teach graduate courses or direct graduate research;
    - the involvement of graduate students in the program evaluation process, and
    - the opportunity for graduate students to participate in the intellectual discourse of departments.

2. A personalized learning format that permits greater student-professor contact (instruction, advising, and guidance) than the undergraduate model.
3. A core curriculum in each program (where it applies) which emphasizes integration of knowledge and preparation for specialization and which is designed to assure mastery of requisite knowledge and skills.
4. A curriculum characterized by advanced disciplinary content and intellectual rigor beyond the baccalaureate level which imparts within its scholarly or professional context an appreciation of the intellectual and/or professional contributions of women and minorities, and prepares scholars and practitioners for a diverse society.
5. A teaching faculty with the PhD. (or other appropriate terminal degree) and relevant professional experience where required.
6. A required demonstration of fundamental knowledge of research methods appropriate to the discipline.
7. A required demonstration of oral and written communication skills.
8. An opportunity to integrate and apply sophisticated knowledge in internships or practica related to the discipline.
9. A required culminating experience (e.g., thesis, project, or comprehensive examination) which demands demonstration of breadth of knowledge in the discipline, depth in specific areas, and the ability to integrate that which has been learned.

Organization and Administration of Graduate Programs

Recommendation 2 (p. 16)

Each California State University campus should identify an administrator who is the chief spokesperson for graduate education and who has direct administrative responsibility for actions and policies affecting the quality of graduate programs. This individual should be the designee of the president in such areas as admissions and graduation policies involving graduate students; should be centrally involved in graduate program development and evaluation, including decisions regarding the implementation of programmatic or budgetary changes that derive from such evaluations; and should be recognized as the campus official (under the president and in consultation with the faculty) most directly concerned with all matters pertaining to graduate program enhancement.

Recommendation 3 (p. 17)

Campuses should assure that students have an organized program of advisement and that all students' progress be monitored. Each graduate student should have a major professor and a faculty committee. The committee should normally be chaired by a tenured or tenure-track faculty member with the Ph.D. or appropriate terminal degree who is also the thesis adviser and/or major professor for the student.

Recommendation 4 (p. 17)

The faculty graduate coordinator in a department or program should be recognized as an important element in promoting graduate student diversity and providing leadership necessary to the vitality and quality of the graduate program. Such recognition should be made explicit by adjustment of teaching load.

Recommendation 5 (p. 17)

Policies concerning the qualifications of faculty teaching or serving in other roles in graduate programs should be established at each of the campuses.

Recommendation 6 (p. 18)

The department (or program) should be responsible for recommending admission of students to graduate programs. Students should be admitted either to Graduate-Classified or Graduate-Conditional status from the outset, if the students' objectives are a graduate degree and they are eligible for admission. Students not admitted to the department or program may be admitted as Graduate-Special, with the understanding that Graduate Special students are not eligible to take graduate coursework in the department (or program) in which they have been denied admission, without explicit approval of the graduate dean and the department or program graduate coordinator. The following categories of postbaccalaureate student should replace current Title 5 categories and be used by all CSU campuses for admission and student classification and for system wide reporting: Graduate-Classified, Graduate-Conditional, Graduate-Special,

Postbaccalaureate-Credential/Certificate, and Postbaccalaureate (2nd Baccalaureate Degree).

Recommendation 7 (p. 19)

A separate graduate application form should be designed, taking into account the need to expedite student notification of admission while simultaneously recognizing the primary role of the department in the process of graduate admission.

The Graduate Experience: The Master's Degree

Recommendation 8 (p. 20)

The percent of graduate coursework required in a graduate program should be increased from 60 to 70 percent (e.g., from 15 units to 21 units in a 30-unit program). A phase-in period of five years should be permitted for existing programs.

Each department offering a master's degree program should make available at least four regular graduate courses in addition to supervision and independent study per year, and new graduate programs should be initiated only if they have the enrollment potential to achieve this minimal level of course offering.

The use of graduate independent study courses should be carefully controlled, and no graduate program should utilize independent study courses (excluding thesis or project) to meet more than 20 percent of the unit requirements for graduate level work. In disciplines that are research-intensive, 30 percent is allowable.

The use of "dual-listed" courses (courses offered under both an undergraduate course number and graduate course number and which enroll both undergraduate and graduate students) should be eliminated or limited to a few justifiable instances (e.g., studio or laboratory courses where the instruction is one-on-one). Existing small programs central to each University's mission may use dual listing where it is necessary to assure sufficient offerings and where course requirements are clearly more rigorous for graduate students.

Recommendation 9 (p. 21)

Means should be sought to increase graduate course enrollments to economically justifiable levels while increasing the availability of graduate level coursework. Such means might include "pooling" graduate courses between rebated departments, encouraging cross-registration, or coordinating graduate offerings in a region with other campuses and institutions.

Recommendation 10 (p. 21)

The development and assessment of graduate student writing competency demands renewed attention. Procedures for assuring writing proficiency both prior to admission and at advanced levels should be periodically examined by each campus. While all students must meet campus standards, alternative means of meeting those standards for students with special needs should he arranged. Information about successful approaches should be disseminated among the campuses.

Recommendation 11 (p. 21)

Teaching opportunities or training should be provided to students as a regular part of graduate programs where appropriate to the discipline. All graduate students employed by the CSU in teaching positions shall be required to participate a discipline-related seminar, or the equivalent, on teaching. Each campus should provide an orientation or workshop for graduate students who will teach.

Recommendation 12 (p. 22)

The choice of culminating experience should be that which is educationally most appropriate to the student, and to the discipline. Where a project or exam serves as the culminating experience, it should be equivalent in rigor to the thesis. An oral defense should be part of the culminating experience.

Recommendation 13 (p. 22)

Regular program review and evaluation should be used by each campus to assess the quality of its graduate program. The evaluation design should ensure that the graduate program is given specific attention separate from the other offerings of the department. The program review guidelines now used at each campus should be reviewed and revised to incorporate the specific criteria and indicators of quality set forth in Section I, above, and in the following recommendations on campus policies and practices. External reviewers should be used in all evaluations of graduate programs, and graduate program review should be monitored by the Dean of Graduate Studies.

Recommendation 14 (p. 23)

Graduate certificate programs should be utilized as a means of responding to student needs for occupationally related graduate coursework without unduly interfering with degree programs. The graduate dean should have administrative responsibility for policies and for monitoring of graduate certificate programs.

System guidelines establishing minimum standards for graduate certificate programs should be developed. Authority for approval of graduate certificate programs should remain delegated to the campuses.