LEARNING ENVIRONMENT

"UCSF's educational technology mission is to create exceptional learning environments through the innovative use of educational technology and information systems and services. The vision includes harnessing the power of educational innovation and information technology to advance UCSF's role as a global leader in health sciences education. Guiding values include service, collaboration, innovation, and scholarship. (Revised 3.4, Revised CFR 3.6, CFR 2.9, , 3.7, 4.1, 4.3)"
-- UCSF Education System Advisory Committee Strategic Plan, June 2008

WASC Commission's Guiding Recommendation 1: Mature the Center for Teaching and Learning by clarifying governance and operational support for the Center including technical support; engage all stakeholders in achieving the interprofessional goals of the center; realize research potential on learning outcomes; and identify student learning projects and outcomes. In order to ensure sustainability, leadership of the Center must develop a business plan and identify how to fund operations.

A. *Mature the Teaching and Learning Center by clarifying the governance and operational support including technical support; leadership of the Center must develop a business plan and identify how to fund operations (Revised CFR 2.2b Revised 3.4, CFR 2.13).*

The Teaching and Learning Center (TLC) is a campuswide initiative to create a technology enhanced education environment (Revised CFR 3.6, CFR 3.7). Funded by California State Proposition 1D, construction began in September 2008 but was halted due to the state fiscal crisis in December 2008. After a nine month delay work was restarted in 2010; the expected opening date is January 2011. The School of Medicine, the Library, and Student Academic Affairs are the lead campus units in organizing the TLC. Representatives from these units and from the Schools of Dentistry, Nursing and Pharmacy have been meeting for more than a year to develop operating principles, identify synergies, and develop budgets and funding models (or sources or proposals) to support the TLC. A Business Plan for the TLC can be found in Appendix 4.

The TLC requires ongoing operational funding. A budget was submitted to the campus in March 2010 as part of a priority request by the Chancellor for educational technology and infrastructure. The Education Systems Advisory Committee supported this effort as well by including these items in their annual budget request. The requested funds will add information technology staff for the new classrooms, expand the Kanbar Center's simulation and interprofessional training services to all UCSF professional schools, and add student customer support for the Technology Commons (Revised CFR 3.4). In June 2010, the Chancellor approved $438,000 for the first year and $542,000 in ongoing support for TLC operations (CFR 1.3). In addition to campus funding, TLC staff have worked with the UCSF Development Office on a plan for external support.

The Library Education Space Program Coordinating Committee has been charged with oversight for the Teaching and Learning Center from its inception (CFR 4.1, 4.2, 4.3). As part of the planning process a cross-school working group is constructing a five-year plan for simulation program development for the TLC. To date, the working group has developed cost models for clinical simulation activities, produced models to determine the capacity of the center and traffic flow, created a sustainable business plan and fostered learning activities across schools and programs (Revised CFR 3.7).

B. *Engage all stakeholders in achieving the interprofessional goals of the Center (Revised CFR 2.2b, Revised CFR 2.3, Revised CFR 2.7, CFR 4.8).*

Interprofessional Education (IPE) is considered an important component of health professions' curriculum and the TLC initiative (Revised CFR 2.3). IPE is defined as formal, planned "occasions when two or more professions learn with, from, and about each other to improve collaboration and the quality of care." IPE is intended to teach students the skills needed to fully collaborate and communicate proficiently in a way that prepares them for the teamwork required to succeed in today's health delivery environment and to improve health outcomes. A 2008 report outlines UCSF's progress toward achieving its goal of innovative and interdisciplinary education and discusses current interprofessional activities and opportunities for future expansion of IPE (Appendix 5).

Building on the simulation program development working group's successful model, a cross-school Curriculum Working Group was launched in spring 2010 to plan short and longer-term education programming for the TLC.

An Instructional Grants Program that funds innovative projects to improve teaching and learning at UCSF is focusing on new learning strategies that will utilize the TLC. Over the past two years the grants program was refocused requiring that proposals involve collaborators from two or more schools. The awards address one of the goals of the campus strategic plan: "to ensure that students and trainees are immersed in a culture that embraces interdisciplinary, interprofessional and transdisciplinary educational programs" (CFR 4.1). Funds can be used to cover faculty release time and other project costs. The following proposals supporting the IPE initiative were funded in the past two years:

Fiscal Year 2010-2011

- Chronic Illness Management by Interprofessional Learners using the Chronic Care Model: Medical residents, Nurse Practitioner Students, and Pharmacy Students in Teams to Improve Care of Adults with Chronic Disease in Weekly General Medicine Clinics (Nursing, Medicine and Pharmacy)

- Development and Implementation of High Fidelity Simulation Cases for Acutely Poisoned Patients (Medicine and Pharmacy)

Fiscal Year 2009-2010

- Patient Simulation to Promote Interprofessional Teamwork and Collaboration among Clinical Practice Level Students (Dentistry, Medicine, Nursing and Pharmacy)

- Designing an Interactive Curriculum for Third-Year Medical, Pharmacy and Nursing Students on Inpatient Geriatric Issues and Safe Transitions in Care (Medical, Nursing and Pharmacy schools)

In addition to the above projects the Student Learning section of this report has a detailed discussion of campus activities designed to create a culture of interprofessional education.

C. *Realize research potential on learning outcomes and identify student learning projects and outcomes (Revised CFR 1.2, Revised CFR 2.3, Revised CFR 2.7, CFR 2.9).*

The TLC will play a key role in accomplishing this goal, as it will support both implementation and innovation in health professions learning, assessment, and scholarship (Revised CFR 2.8, Revised CFR 4.4). Program development that nurtures inquiry and discovery is well underway across schools. The TLC will expand capacity for student learning projects and outcomes research and the opportunity for sharing across the campus. The initiatives listed below document selected examples of learning outcomes projects already occurring on campus.

The Pathways to Discovery Program, open to all UCSF learners, is designed to facilitate motivated learners in developing the knowledge, skills, and experience to contribute to health beyond the care of individual patients. The five pathways are: a) clinical and translational research; b) global health; c) health and society; d) health professions education; and e) molecular medicine. These pathways represent areas of specialization including health research, curriculum and education theory development, policy and advocacy, and other interventions to improve health on a global scale.

The **School of Dentistry** has embarked on a portfolio project for dental students who are learning dental surgical skills. The project will support elaboration and investigation of student learning and outcomes. Each student creates a portfolio of specific procedures, documenting the steps from diagnosis to completion, and providing evidence-based rationale for each activity. They also collaborate online to discuss the projects and understand differences in treatment philosophy (Revised CFR 1.2).

Research Poster Sessions allow students in the **School of Medicine** who have received research funding to present their work. Other students who have completed research projects while in medical school are also encouraged to participate. Additionally a Dean's prize for Research is awarded to students "who have the creativity

and curiosity that is an essential characteristic of the great physicians and great scientists of the future"

Faculty in the **School of Nursing** have been involved on several planning committees for the Teaching and Learning Center, as well as the Kanbar Simulation Center. Simultaneously, the School has been undergoing a complete revision of the Master's core and specialty curricula. In revising the curriculum to meet the needs of and to engage diverse learners with varying learning styles, faculty have explored innovative teaching-learning strategies and have begun to re-format classes to enhance learning. The TLC will be a focus of the ability to meet learning needs in the new curricula, as it is envisioned.

Large core curriculum and clinical specialty core courses will use multiple rooms – large lecture rooms with electronic media to present or explore new information or concepts, and then students will move to multiple break out rooms to make learning more personal in small groups. Small group work will be focused on application, using simulation, educational technology, role play, etc., with a focus on the specific role and specialty practice areas associated with the student's program of study. The School will be monitoring expected learning outcomes and other evaluative benchmarks (such as certification exam pass rates) from the new curricula, to compare with the student's achievement of learning outcomes and evaluative benchmarks from the out-going curricula. Additionally, faculty will be monitoring the quality of student presentations, group work outcomes, projects and other class activities in achieving expected learning outcomes.

Faculty have begun discussing ways in which to document the achievement of learning outcomes using various learning activities, including those which will be available in the TLC. Currently, approximately 75 nurse practitioner students per year participate in an interprofessional learning activity in the School of Medicine simulation lab, which will continue in the TLC when it opens in January 2011. Faculty are beginning now to look at the differences in how students who have been through the interprofessional learning activity in the current Kanbar Sim Center interact with patients and the other professionals on multidisciplinary teams in the clinical setting. This may be a first attempt to document through research the impact simulation and interprofessional learning activities have on learning outcomes and patient care.

In 2010, the **School of Pharmacy** adopted revised educational outcomes for the Doctor of Pharmacy degree program. A new educational software management system will be used to map revised educational outcomes to identify curricular gaps for an ongoing curriculum review and revision process. Student electronic portfolios and assessment instruments and processes for learner, teaching, course and curriculum evaluation are undergoing review and revision as they are migrated into the new system. These changes, in turn, are fueling studies related to examining curriculum innovation and assessment.

All students in the Doctor of Pharmacy program enroll in one of three specialty pathways (Pharmaceutical Care, Health Services and Policy Research, and Pharmaceutical Sciences) and complete a pathway-specific senior research project. Results of projects are typically disseminated. For example, of the projects conducted by Pharmaceutical Care pathway students between 2002 and 2007, 47.3% were presented at an institutional forum (e.g. Pharmacy and Therapeutics committee meeting in a hospital or health system), 27.7% were presented as a poster or platform presentation at a local, state, national, or international meeting, and 5.3% were published. Over 90% of faculty serving as a Pharmaceutical Care pathway project advisor report that the results of the student projects are valuable to their institutions or organizations.

The first annual campuswide **Inter-School Research Festival** took place May 18-21, 2010. Sponsored by the Clinical and Translational Science Institute and the Pediatric Fellowship Program, the festival participants included students from the Schools of Nursing, Pharmacy, Dentistry, and Medicine as well as from the Pathways to Discovery Program, the Doris Duke Fellowship Program, the Office of Student Research, and the Pediatrics Subspecialty Fellowship Program. The event included symposia, a poster session (Posterpalooza), an inter-school Journal Club, and selected oral presentations (CFR 2.9).

WASC Commission's Guiding Recommendation 2: Continue development of and communicate plans for a viable integrated information technology infrastructure, such that the academic, healthcare and administrative enterprises can be better served by stable, secure and coordinated information resources and state-of-the-art learning tools.

Since the last WASC visit the campus has made significant progress in updating the campus education infrastructure (Revised CFR 2.2b).

A. Instructional technology initiatives for fiscal year 2009-2010.
Two educational initiatives received campus funding in fiscal year 2009-2010 following recommendations from the Education Systems Advisory Committee (ESAC) (CFR 3.7, 4.2). First, the Collaborative Learning Environment (CLE) received funding for one year. The CLE is used by all schools and graduate programs to provide a platform for learner-centered environments and collaborative activities. The CLE allows the schools and programs to customize learning modules using a combination of classroom and virtual teaching and learning methods. Working with the schools, ESAC developed a Five Year Roadmap (Appendix 6) that outlines new functions critical to UCSF education programs including ePortfolios, Virtual Microscopy, Elluminate and a Curriculum Management System (Revised CFR 3.4, Revised CFR 3.6, CFR 3.7, 4.1, 4.2).

The second educational priority was content capture. In January 2010, the Chancellor approved funding to establish and support a new, robust content capture system for 11 classrooms including portable units to extend coverage beyond the 11 classrooms (CFR

1.3). The same system will be installed in the TLC classrooms. An analysis is underway to select the optimal system to meet the needs of the educational programs.

Also of note, the Office of Information Technology Services (formerly called the Office of Academic and Administrative Information Systems), the central campus information technology organization, added wireless connections for all classrooms on Parnassus in late 2009 (CFR 3.7).

B. Priorities for educational technology improvements 2010-2015.
In January 2010 Chancellor Desmond-Hellmann requested a report identifying short- and long-term priorities for the campus educational infrastructure Appendix 7(Revised CFR 3.4, Revised CFR 3.6, CFR 3.7, 4.1). The report builds upon the Education Systems Advisory Committee Strategic Plan that was completed in 2008 Appendix 8 and the two initiatives that received one-time funding in fiscal year 2009-10 (CFR 4.1, 4.2). In addition to funds to support the Teaching and Learning Center, ESAC presented four educational technology improvements to the Chancellor as high priority items. Of the four campuswide initiatives listed below, the campus approved ongoing funding beginning in 2010-2011 for Content Capture, CLE Operations and Upgrades, and TLC Operations. The fourth, a central IT help desk for students and trainees will be considered as part of a larger help desk for the entire campus community.

The newly funded **Content Capture** and delivery system will provide state-of-the-art functionality to capture audio, VGA output from computer to projector, and, in some classrooms, video. The system will allow students to review the captured content on the Web and, likely, to download the content to their computer or mobile device.

The **Collaborative Learning Environment** (CLE) provides core functionality for UCSF professional school and graduate programs to meet current and future curriculum needs. It is designed to support a learner-centered environment. The five-year roadmap outlining plans for adding new functions critical to UCSF education programs such as portfolios, curriculum management and content capture will require additional support and training for faculty and students (Revised CFR 3.4). Funding for this initiative enables ongoing support for a centralized, integrated learning platform.

The Teaching and Learning Center (TLC) is the realization of the UCSF strategic goal to develop exceptional educational facilities and infrastructures to keep UCSF at the forefront of health sciences education. As described above, The TLC will provide a technology-rich environment in support of interprofessional and transdisciplinary learning programs at UCSF. The programs will focus on training future health professionals and scientists to become leaders in delivering high quality care to underserved communities.

In addition to these campuswide innovations, the School of Dentistry has now opened the **Fleming Predoctoral Simulation Lab**. The lab is designed to provide a simulation environment for dental students to practice skills before working on patients. Students

watch demonstrations and then work on models under the close guidance of faculty. The high tech lab highlights the innovative research in the Dental School. The Lab was featured in an article in *Wired* magazine – "Dentistry Goes Digital".

C. Campus IT Initiatives that support Education
A high priority in the UCSF Strategic Plan (CFR 4.1) is to "develop educational facilities and infrastructures to keep UCSF at the forefront of health sciences education and meet the growing demand for health care professionals."

The new Chief Information Officer, Elzar C. Harel, PhD, recently presented the campus with the priorities for the unity formerly know as the Office of Academic and Administrative Information Systems (OAAIS), now known as Information Technology Services (ITS). A full list of priorities can be found in Appendix 9.

The UCSF CIO is assembling a task force to consider a campuswide IT Help desk. This would expand the ESAC proposal for a Student Help Desk to include the entire UCSF community. If approved the Help Desk could be operational in fiscal year 2012 (Revised CFR 3.4).

During their training UCSF students encounter multiple electronic medical record (EMR) systems and receive uneven training in EMR use. As part of the TLC clinical experience students will be required to use an electronic medical record. Plans are underway to charge a working group to look at educational uses of an EMR, which is essential to consider given UCSFs Medical Center plans to implement use of electronic medical records in 2011.

D. Changes to Library in an Educational Technology Environment
Along with the construction of the TLC, the Library is working on a project to open a portion of the Parnassus Library for 24-hour, 7-days-per-week use by students (Revised CFR 3.6, CFR 2.13). A place to study, consult digital materials, and prepare for exams and papers after the library closes has been a long-standing need for UCSF students. This redesigned space is a response to reductions in library hours. Modifications to the Library's Hearst Reading Room, a 3,500 square foot area off the entrance of the Parnassus Library, will permit unstaffed 24-hour use. The room will be open to UCSF students in phases as funds are raised (CFR 2.13).

The Hearst Room opened for Saturday use in February 2010 and 24-hour access is expected by late 2010. On the opening day in February one student commented, "One hour studying in the library is worth three hours at home." Both the Library and Student Academic Affairs contributed initial funds to begin the project followed by a generous gift from the Hearst Foundation. In June, the Chancellor approved the use of some Registration Fee funds to help cover the cost of this important project (CFR 1.3). Additional funds are expected from alumni.

WASC Commission's Guiding Recommendation 3: Contribute to the generalizable knowledge through the development of rigorous design and assessment of its many initiatives, thereby learning from our own best practices and contributing to the literature in health professions education.

UCSF schools and academic programs add to the health professional education knowledge base in numerous ways. A compendium of UCSF scholarship and publications, *Contributions of UCSF Faculty, Staff and Students to the Scholarship of Teaching,* is included in Appendix 10 documenting recent contributions made during the past three to five years by UCSF faculty, students and staff (Revised CFR 2.8, Revised CFR 4.4, CFR 2.9, 3.1).

Initiatives in each school offer opportunity for faculty in all series to promote curriculum innovation and scholarship in education (Revised CFR 2.8, Revised CFR 3.2, Revised CFR 3.4). Additionally, programmatic support for developing future faculty is robust (CFR 3.1).

The **School of Dentistry** provides faculty development during noontime sessions for improving instruction using technology. Timing is critical to permit maximum faculty attendance without interfering with clinic operations. Faculty have been trained this past year on the use of the Collaborative Learning Environment, Articulate Presenter for narrating PowerPoint lectures, and lecture casting in the classrooms (Revised CFR 3.4). In addition, the Library provides online training to enhance the use of the CLE by faculty (Revised CFR 3.4). Many dental faculty are also active members of the American Dental Education Association (ADEA) and participate in programs that contribute to curriculum development. The School has pioneered an integrated dental curriculum that has become a model for many and hosts visitors from various institutions who come to experience the developments. One such visit included the dean and five senior faculty and administrators from the Medical College of Georgia. Over a two-day time period the visitors interviewed course directors and began to develop a curriculum based on the UCSF model. Relevant, specific papers and presentations are detailed in Appendix 11a-c.

The **School of Medicine** has an extensive approach to help faculty improve their skills as educators and to develop educational scholarship that can be disseminated (Revised CFR 2.8, CFR 2.9). Faculty development efforts are supported by two main programs: the Office of Medical Education and the Academy of Medical Educators. Both programs deploy a variety of approaches to engage faculty in education and often partner in their work, such as an annually sponsored Faculty Development Day to focus on topics critical to the faculty. The 3rd annual Faculty Development Day was held February 23, 2010. The focus was on implementation of electronic portfolios, demonstration of the UCSF portfolio platform and presentation of portfolio pilot projects.

The **Office of Medical Education (OME)** initiates and oversees numerous initiatives and programs that support faculty development as educators. One example is the

Teaching Scholars Program, in which faculty selected in a competitive process can participate in a longitudinal experience to learn about education. Each scholar works on a project in that program and is mentored by one of the five UCSF School of Medicine educational researchers. Participants from other UCSF schools have successfully competed for slots in this program and its impact has been felt on programs across the UCSF campus.

OME faculty provide individual consultation for faculty undertaking educational scholarship. Additionally, OME sponsors a weekly seminar, the Educational Scholarship Conference (ESCape), to mentor faculty in the development of their educational scholarship. Individuals request a consultation and materials are distributed to a large list of interested faculty. Participants can attend the physical meeting or join by conference call. Consultations include a review of ideas, abstracts, manuscripts and posters as well as practice opportunities for oral presentations. The website is updated weekly. Interested individuals can read a description of the program and view the consultations schedule at (CFR Revised CFR 2.8, CFR 2.9).

Grant programs are also available to encourage research into medical education. The Office of Medical Education funds two **Medical Education Research Fellows** every other year. These individuals spend one day a week for two years developing their educational scholarship. The program description can be found at the Medical Education Research Fellows link. The OME also provides seed funding via a competitive peer review process for faculty proposals to do educational research (a description of this program can be at the link) (Revised CFR 2.8, CFR 2.9).

The Office of Medical Education produces an Annual Report describing academic programs that contribute to the scholarship of teaching and learning (Revised CFR 1.2). In 2008-09, School of Medicine faculty members, students, residents, fellows and staff gave 270 scholarly presentations or workshops on medical education locally, nationally and internationally, and published 62 peer reviewed journal articles. Additional faculty members received 88 honors and awards for leadership and scholarship in medical education (see Office of Medical Education Annual Report in Appendix 12).

The UCSF School of Medicine's **Haile T. Debas Academy of Medical Educators** honors and rewards excellent teachers and provides service to the school and fellow educators. The Academy offers intramural grants, endowed chairs for physicians whose passion is teaching, mentorship and professional development and visiting scholar lectures, and sponsors an annual Education Day to disseminate ongoing innovation and scholarship on education (Revised CFR 2.8, CFR 2.9).

The School of Nursing's commitment to assessment, teaching-learning initiatives, innovation, and sharing best practices is best demonstrated through scholarship (CFR Revised CFR 1.2, Revised CFR 2.8, CFR 2.9). The School of Nursing faculty has generated over 75 journal articles and book chapters within the past three years and

these are referenced in the *Contributions of UCSF Faculty, Staff and Students to the Scholarship of Teaching (*Appendix 10*).*

The topics range from innovative methods in teaching advanced practice nursing students to care for underserved populations to recruiting diverse students into graduate (MS and PhD) programs of study. School of Nursing faculty are also well represented at local, regional, and national conferences of specialty organizations as well as faculty specific conferences, where faculty present podium and/or poster presentations on various topics related to the education of pre-licensure and graduate students in nursing. Conferences such as those sponsored by the Western Institute of Nursing, the National Organization of Nurse Practitioner Faculty, and the American Association of Colleges of Nursing are well attended by School of Nursing faculty, where podium or poster presentations are made. The School of Nursing also produces a publication entitled *The Science of Caring* four times per annum. Two of the issues are devoted to highlighting exciting and innovative teaching, education, and practice strategies. The other two issues are focused on research discoveries.

The School of Nursing's Diversity in Action (DIVA) Committee provides one example of how the School has contributed to generalizeable knowledge (CFR 1.5). The DIVA initiative has focused on increasing diversity-related content in the curriculum and in the learning environments of classroom and clinical settings. A series of six courses was developed by the DIVA Committee to assist faculty in incorporating diversity-related content into their courses, and to provide strategies for faculty to address potentially uncomfortable classroom and clinical-related situations related to diversity issues. These courses have subsequently become modules and all core course faculty are required to complete all six modules. The modules were developed on the basis of student input on the diversity content in the School's Master's curriculum and faculty requests to learn more about handling difficult student-faculty and student-student diversity issues when they arise. This work has been published in an issue of the *Journal of Transcultural Nursing* (2008). The modules have been extremely well-received by faculty. Assessment of the effectiveness of the modules is ongoing and a standard question related to incorporation of diversity-related content was added to the Master's Student Exit Survey that is an ongoing monitoring of course evaluations.

Contributions of UCSF Faculty, Staff and Students to the Scholarship of Teaching (Appendix 10) includes 46 entries from **School of Pharmacy** faculty or pharmacy students over the last six years (Revised CFR 2.8). Included are textbooks, book chapters, and individual articles, as well as posters and presentations at various professional or educational association meetings. Although all students in the School are trained in the design and presentation of posters, a handful will choose a pedagogical project (experiences with an experimental coursework, methodologies, etc.) and will present at professional or educational association meetings. Faculty members in the School have been leaders in shaping pharmacy education for the nation. They do so through their work on committees and commissions of the American Association of Colleges of Pharmacy, as well as serving as elected officers.

One recent example of the School's international recognition as a leader in innovative curriculum design is the development and dissemination of the *Rx for Change: Clinician-Assisted Tobacco Cessation* curriculum. This comprehensive, turn-key, tobacco cessation training program, based on principles from the U.S. Public Health Service Clinical Practice Guideline for Treating Tobacco Use and Dependence, is used to train health professions students, educators, and licensed practitioners. A NIH grant helped fund five national train-the-trainer programs in the first systematic attempt within any health discipline for broad-scaled dissemination and evaluation of a shared curricular resource among all accredited programs in the U.S. Eighty-nine of 91 accredited schools at the time participated in one of the five live training programs. In addition, over 4000 individuals from all over the world have downloaded over 92,000 curricular files for use since 2004.

In 2004 UCSF introduced the Preparing Future Faculty, modeled after the Preparing Future Faculty national initiative. UCSF's program was founded by a group of UCSF graduate students and postdoctoral scholars who recognized a need to balance UCSF's excellent training in research with better training in teaching. The program is designed to increase the value for and visibility of teaching training at UCSF, to broaden the opportunities for students and postdoctoral scholars to gain teaching experience, and to prepare them for the academic job search. The program includes a series of campuswide events, courses, a teaching apprentice program, and activities to prepare for an academic job search.

Emphasizing interprofessional education and harnessing technological advances, UCSF continues to implement improvements to its learning environment. The Teaching and Learning Center is at the forefront of UCSF's advancement of these goals and represents a strong collaboration and clear commitment to student learning. In addition to the technological advancements represented by the TLC, the campus has implemented a multitude of other technology-based initiatives including the Collaborative Learning Environment, Content Capture, and the School of Dentistry's simulation lab. The examples of student learning projects and faculty teaching contributions also serve as excellent indicators of the productivity and broad impact of the learning environment at UCSF.