

Essay 2: Student Learning Outcomes

What are the optimal curriculum structures to effectively prepare students for contemporary challenges in the health professions? (Guiding question, Institutional Proposal)

In response to this question, the faculty developed two strategies to meet the opportunity presented by the accreditation process to analyze and improve the curriculum. The questions related to fostering interprofessional education and exploring ways to encourage our graduates to pursue academic careers by identifying and removing barriers. The faculty reviewed professional education in the context of the CFRs to focus on these issues. The resulting report, including specific responses by school to specified criteria are presented in Appendices 8 through 14 (CFRs 2.8, 2.9, 2.10, 2.11). Exploration of the guiding question and actions initiated in response are described below.

Contemporary health care is more complex and intricate than at any time in history. The model of physicians, pharmacists, nurses, dentists, and scientists working in isolation is rapidly being replaced by a collaborative model that views health care as affecting the entire body and therefore requiring all members of the health care team be engaged in providing care (CFR 2.1). This shift presents an educational challenge to prepare students to work effectively in teams when their existing curricula are already so demanding, both intellectually and temporally (CFR 2.10). Further, today's professional and graduate education tends to focus students on earning the specific degree, and requires mastery of huge amounts of material and intensive curricular hour requirements. With this tremendous time commitment and goal orientation, it is also difficult for faculty to inspire trainees to look to careers in academia, even though population demographics dictate that health professional faculties will be facing an extraordinary number of retirements over the next few years as the baby boomer generation ages. Learning outcomes to address these two issues are the focus of this portion of the WASC study, and are clearly identified as benefits to professional education at UCSF resulting from the WASC self-study process.

Strategy 1. Prepare students for a collaborative model of health care by offering opportunities in interprofessional education and health care teamwork (CFRs 2.10, 2.11).

UCSF created a campus task force, The Interprofessional Education Task Force (IPETF), to develop and support interprofessional academic and co-curricular activities in 2003. The IPETF comprised of associate deans from each of the professional schools and was charged by the deans of their respective schools. The charge, dated August 29, 2003, included a call to "achieve small steps towards greater interdisciplinary education at UCSF." The group's first evaluation of interprofessional activities identified considerable interest on campus in this topic, but also identified the problem that most initiatives had "floundered or languished as a result of lack of resources, leadership, priorities, time, or some combination thereof" (memo to deans

dated June 9, 2004). The IPETF set about overcoming these barriers to create sustained interprofessional programming and support interprofessional efforts on campus. Because of the complexity of these issues, two years elapsed between the creation of the IPETF and the first interprofessional day for all incoming health professions students, which was held on September 20, 2006 (CFR 2.11). The inaugural event was an afternoon program for all incoming students highlighting patient safety, and titled "Patient Safety and the Value of Team Training as Health Professionals." The program included a welcome from the Executive Vice Chancellor and Provost, an interactive patient safety skit performed by the deans with small group discussion, a keynote speech by Dr. Robert Wachter, followed by a reception. All incoming students received the book *Internal Bleeding* authored by the keynote speaker and completed a reading assignment. Planning for this day clearly demonstrated that strong leadership could overcome many of the barriers to interprofessional experiences and the event was held again in September 2007 and September 2008. Descriptions of the events and evaluations by participants are included in Appendix 9. The Interprofessional Days were well received by incoming students, who rated the overall program 4.29 on a scale of 1 to 5 in 2006 and 4.16 in 2007 (CFRs 1.2, 2.3, 2.4, 2.7, 2.10).

In light of this success, IPETF helped recruit an interprofessional group of faculty to participate in the Program for Educators in Health Professions. This group reviewed existing programs and addressed barriers to the inclusion of interdisciplinary learning on campus. Among their successes were lunchtime seminars on learning skills, and the development of video modules of patient communication that will be incorporated into core curricula of all our professional schools. Representatives of this group met regularly with the IPETF to provide cohesion and broad support for their activities. This is one example of the importance of leadership in encouraging interprofessional engagement and finding methods to create sustainable opportunities (CFRs 2.5, 2.7, 2.8, 2.9, 2.10, 4.6, 4.8).

The IPETF also supported a survey to systematically identify interprofessional co-curricular offerings. Knowing the activities that already exist permits the task force to support individual efforts and better address barriers to success. The Catalogue of Interprofessional Co-Curricular Activities was completed during Summer 2008 (see Appendix 10). The IPETF intends to use this completed catalogue as a resource to publicize interprofessional opportunities, and importantly, elevate the knowledge of these educational opportunities for the campus community. The task force will also be able to review data from these activities and begin to assess the learning outcomes for students in the professional schools (CFRs 2.4, 2.7, 2.8, 2.10).

Since the approval of the Institutional Proposal, UCSF has made progress on implementing several initiatives that support interprofessional education (CFR 2.11). These initiatives are described in greater depth in Essay 1 (CFRs 2.4, 2.5):

- **On-Line Course Schedule.** Beginning in Fall 2008, UCSF students can access an on-line schedule for all courses offered on campus.

- **Common Academic Calendar.** A Campus Academic Calendar Committee completed a report, along with a proposed new 2009-10 calendar, in November 2008.
- **Teaching and Learning Center.** This new educational facility has been designed to support interprofessional education. We anticipate that it will be one of the primary sites where interprofessional education initiatives are located in the future.

Strategy 2. Encourage graduates to pursue academic careers by removing barriers and fostering opportunities for scholarship, creative activity, and educational mentorship (CFRs 2.8, 2.9).

The second major issue identified by the guiding question relates to the impending problem of growing the health sciences education faculty and replacing faculty as they retire (Data Exhibit 4.4). As an example of the magnitude of this issue, in dentistry today there are over 300 vacant faculty positions among 58 schools of dentistry. Education must play a major role in addressing this need.

To begin this process, each professional school identified existing curricular offerings that encourage and prepare health professions students to consider academic careers. In addition, campuswide opportunities were catalogued to identify the extent to which opportunities existed outside the individual schools (see Appendix 11). A summary of the findings follows, along with references to corresponding tables and appendices for further details.

School of Dentistry

To address the impending shortage of dental academics, the School of Dentistry has developed a number of elective activities to prepare students for academic careers (CFRs 2.9, 2.10). These electives emphasize teaching and research. The faculty provide both elective teaching and tutoring opportunities (#1 and 2 below are examples). In addition, faculty-sponsored dental student organizations create activities that stimulate interactions between interested students and research-intensive and teaching-intensive faculty (#3, 4 below). In 2008, the School of Dentistry was awarded a T32 training grant by the National Institute for Dental and Craniofacial Research and the National Institutes for Health (NIDCR/NIH), which will support up to five students per year to pursue a combined DDS-Masters in Clinical Research degree track (#6 below). This program is analogous to the Pathways program offered through the School of Medicine and described previously. Each of these opportunities aims to assist students in understanding the responsibilities of an academic career and in gaining experience in those aspects of academic life that distinguish it from a practice career. A brief description of the opportunities follows.

1. Teaching elective taken for academic credit offers mentoring and practice in small group settings, and one-on-one laboratory instruction in simulated surgical

dental procedures. Students are selected based on their demonstrated ability to tutor students needing academic assistance (CFR 2.3).

2. Teaching elective in anatomy for second year dental students provides mentoring and development of small group teaching skills in the dissection laboratory, and creation of teaching aids, such as preparing anatomical prosections (CFR 2.3).
3. John Greene Society, the UCSF student chapter of the American Association for Dental Research, creates research mentoring opportunities for students, fosters research activities, and arranges for lunch time or early evening talks by research-intensive and teaching-intensive faculty as a way of expanding student knowledge of academic career paths (CFRs 2.5, 2.8, 2.9, 2.10).
4. School of Dentistry Research and Clinical Excellence Day. One day each fall, the school closes all clinics and classes to include both students and faculty in a program that includes research presentations, a keynote speaker of national prominence, and presentation of both a faculty research award and a faculty clinical excellence award. Student research is highlighted with oral presentations and a poster session, and entries are judged by faculty. (CFRs 2.5, 2.8)
5. American Dental Education Association UCSF student chapter. Student members participate in career development through seminars with faculty and administrators to explore academic career options. The association sponsors national competitions for awards that enable selected students to work with a faculty mentor and participate in didactic, laboratory, and clinical teaching, and interact with other students selected from dental education institutions around the country. The school has one awardee this year (CFRs 2.5, 2.8).
6. DDS- Masters in Clinical Research 5-yr combined degree track began in 2008. Students are now being recruited for this opportunity (CFR 2.2).
7. DDS-PhD Program educates dentists who desire to follow a career in academia. The program includes laboratory rotations early in the program and a seminar series from the PhD program (CFRs 2.2, 2.8, 2.9).
8. Institutional Dentist Scientist Award provided support for dentists pursuing a PhD in addition to a dental specialty program. PhD options included Oral and Craniofacial Sciences, Bioengineering, or Epidemiology in cooperation with the School of Public Health at UC Berkeley. The Institutional Dentist Scientist Award program operated from 1996 to 2004. Six of the seven trainees completed the program and are now working in academia, four of them at UCSF (CFRs 2.2, 2.8, 2.9, 2.11). More details can be found in Appendix 12.
9. Dental Scientist Training Program (http://dentistry.ucsf.edu/admissions/UCSF_DDS-PhD.pdf) integrates the DDS program with a PhD program, and adds a fourth option for a PhD in Bioinformatics. Students follow the DDS curriculum for the first 3 years, working on research in the summers and doing laboratory rotations. In year 4, they begin a program of 80% research and graduate study combined with 20% clinical practice until clinical requirements are met for the DDS. Once the student is licensed, this pattern continues in UCSF clinics until the PhD is awarded (CFRs 2.2, 2.8, 2.9, 2.11).

Many discussions have occurred within the school to identify barriers for students to pursue academic careers. There appear to be two thrusts needed to effect any change. First, student focus groups revealed that many applicants to dental school are totally focused on becoming a practicing dentist and have not given any thought to combining that goal with academics. Second, student educational indebtedness focuses them on graduation, licensure, and practice to maximize earnings and manage the financial burden. The magnitude of the burden is huge and growing; 78% of the dental graduates in 2008 owed an average of \$129,000 for dental school alone (CFR 2.10).

School of Medicine

UCSF School of Medicine is well recognized for its leadership in innovation in medical education. This innovation extends not only to the curriculum for preparing physicians, but also to our curriculum to prepare individuals in areas that enhance their expertise as a physician beyond routine health care (CFRs 2.1, 2.7). These areas are part of our recently implemented Pathways to Discovery curriculum (<http://www.medschool.ucsf.edu/pathways/>). Each area is preparing students with skills to enhance their careers as faculty members. These programs contain curricula in research methods and statistics that will allow students to produce future scholarship required of faculty (CFRs 2.8, 2.9). However, a fundamental role of faculty is teaching. One UCSF Pathway is focused specifically on health professions education (http://www.medschool.ucsf.edu/pathways/health_professions/). As designed, students can take all or just sample the core curriculum. The core curriculum provides an understanding of education with foundation level coursework focusing on teaching strategies, using best practices, and understanding the inquiry methods used in education. Students participate in a variety of practical experiences allowing them to engage in the roles of a faculty member. Students develop projects that focus either on curriculum development (and its subsequent evaluation) or on educational research. Students in this program receive extensive mentorship by the Health Professions Education (HPE) faculty and also by project mentors. The HPE faculty members include physicians with a passion for education, physicians with master's degrees in education, and faculty with doctoral degrees in education. This provides UCSF students with a broad understanding of what it is to be a faculty member. The Pathways to Discovery built on previously existing areas of concentration. The areas of concentration began in 2003, and in the graduating class of 2008, 40% of the class participated in an area of concentration and 14.5% of the class chose medical education (CFRs 2.2, 2.3, 2.4, 2.5).

UCSF has a longstanding program of near-peer teaching. Second year medical students lead the Medical Student Teaching Program preparing sessions to help first year students. The success of this program to engage the learners has been described in the literature (Lockspeiser, TM; O'Sullivan, P; Teherani, A. & Muller, J. (2008). Understanding the experience of being taught by peers: the value of social and cognitive congruence: *Advances in health sciences education*, 13(3), 361-72.) This program lays the foundational experience for many students as medical educators.

The School of Medicine is planning a pilot program with the University of California, Berkeley School of Education for an MA degree with a specialization in health professions education (CFR 2.11). Students will have the opportunity to extend their education to complete this degree. Students specifically interested in participating in educational activities to a greater depth can take a year to explore as a Medical Education Fellow. Students who have done this in the past have developed curriculum innovations, implemented and piloted new strategies, and enhanced their teaching skills (CFR 2.4).

UCSF provides an environment supportive of faculty in their role as educators (CFR 3.4). UCSF School of Medicine offers ongoing faculty development specifically around the educator role (<http://www.medschool.ucsf.edu/workshops/>). These activities are open to all. This year-long faculty development program, which -- while primarily for faculty members -- has had student and resident participants (<http://www.medschool.ucsf.edu/teachingscholars/>). Students are invited to participate weekly in the Educational Scholarship Conference (<http://www.medschool.ucsf.edu/medicaleducation/ESCape/index.aspx>) where everyone is invited to share their work and receive feedback. Students can also attend offerings from the Haile T. Debas Academy of Medical Educators (<http://medschool.ucsf.edu/academy/>). The value of the role of a faculty member as educator is visibly supported at UCSF School of Medicine (CFR 2.4).

School of Nursing

The UCSF School of Nursing has a 40-year history of doctoral education in nursing and sociology, with time to degree completion rates well below the national average of eight years. Historically, the average time to a UCSF doctoral degree from a master's degree was 5.2 years at UCSF. However, a few students each year manage to complete the doctoral program in 3 years, with this combination of incoming indicators: purposeful goals, strong and secure financial support from family or scholarships/loans, and the ability to attend school full time without outside work during their course of study. Undertaking a full-time role as a student is challenging for many doctoral students, many of whom have significant financial obligations related to family responsibilities (CFRs 2.5, 2.6, 2.10).

Representatives from the Betty Irene Moore Foundation Nursing Initiative met with the dean of the School of Nursing in the summer of 2003 to discuss the goals of the Initiative. One of the overarching goals was to improve the quality of nursing-related patient outcomes in adult acute care hospitals in five San Francisco Bay Area counties. A key outcome of this goal was to develop a more highly skilled nursing workforce by educating more nurse faculty and supporting nursing schools in the five counties by helping them to meet their current and projected faculty needs. An adequate supply of qualified faculty is an essential key to increasing the capacity to educate new nurses. As a result of this meeting, the UCSF School of Nursing Accelerated Doctoral Program was proposed in the fall of 2003 (CFRs 2.8, 2.9). The last class of 5 Betty Irene Moore

Fellows was admitted to the program in Fall 2008. More details of the history and content of this innovative program can be found in Appendix 13.

New UCSF strategies for addressing the faculty shortage have focused primarily on the Moore Foundation partnership. However, the ongoing commitment of the faculty to produce scientists and leaders in nursing via the doctoral program spans 40 years and has produced national and global academic leaders, including numerous deans (CFRs 2.2, 2.3, 2.8).

Additional opportunities for students in the School of Nursing to prepare students for future faculty and nurse educator roles include (CFRs 2.8, 2.9):

1. Teaching Minor: for students interested in academic nursing education in associate degree (ADN), baccalaureate (BS, BSN), and Master's degree (MS, MSN, MN) programs. Students take at least two academic courses in education and at least one 3-unit N400 series practice teaching course (CFRs 2.2, 2.3). Courses taken for the teaching minor are listed in Appendix 14.
2. Teaching Assistantships: The school hires 8-12 TAs per quarter each year. Masters and doctoral students are mentored by faculty in the TA role, and they often provide a content lecture or conduct a seminar session as an apprentice in collaboration with the faculty of record (CFR 2.2, 2.3).
3. The Associate Dean, Academic Programs & Diversity Initiatives and the Assistant Dean, Academic Services & Diversity Enhancement coordinate workshops, seminars, and programs with staff from the Office of Career and Professional Development specifically for nursing students interested in and considering careers in academia (CFR 2.4).

School of Pharmacy

As a key element in its strategic plan, the School of Pharmacy is articulating a clear path for PharmD students who wish to pursue research and an academic career (CFRs 2.8, 2.9). We strongly encourage students in the program to avail themselves of opportunities for training in clinical research such as PACCTR, and at the same time, we are working to develop opportunities for our PhD graduate and postdoctoral students to gain clinical insights and become involved with translational research. Teaching experiences are available to both PhD and PharmD students as paid TAs or for academic credit, and all course assistants are mentored and receive teaching evaluations. Last year, in collaboration with our Academy of Student Pharmacists chapter, the Office of Career and Professional Development held a workshop on Demystifying Academic Careers in Pharmacy, which will be repeated this year (CFR 2.10). Finally, we are hoping to establish a post-PharmD clinical pharmacology and therapeutics research training fellowship program to provide additional training for pharmacists interested in academia (CFRs 2.2, 2.3, 2.4).

Graduate Division

The Graduate Division strongly supports the preparation of PhD students to be highly competitive for future faculty positions through a variety of activities that include research, teaching, writing, and making presentations (CFRs 2.8, 2.9). First, the PhD recipient must have a strong record of research accomplishments. This mandatory skill is congruent with existing PhD research training in each graduate program. To enhance students' abilities in this area, the Graduate Division offers competitive research grants to enable some independent student research in their chosen discipline (CFRs 2.2, 2.3).

Equally important are opportunities to gain experience in teaching, and knowledge of didactic practices. These opportunities include a combination of learning modalities offered through: a one quarter teaching assistantship through their graduate program, presentations made to journal clubs, and the Preparing Future Faculty program offered by the UCSF Office of Career and Professional Development (OCPD). Some students also engage in more intensive teaching experiences and course responsibilities at local institutions such as the University of California, Berkeley, the University of San Francisco, and San Francisco State University (CFR 2.11). Many students also volunteer to teach in the Science Education Partnership (SEP), bringing science to the K through 8 schools in the San Francisco Unified School District (CFR 2.3).

Writing and making presentations are essential skills for an academic career and they are fostered in a number of ways. Portions of the qualifying examination are written and critiqued extensively by several faculty mentors. Workshops on writing are offered by the OCPD. Journal club experiences help fine-tune a student's presentation skills, as does attendance and presentation at national meetings. The Graduate Division offers competitive travel funds to enable student attendance and presentations at national meetings (CFRs 2.2, 2.3, 2.4, 2.8, 2.9, 2.10).

Of special note, several PhD programs require their first year graduate students to write an extramural fellowship application. UCSF is fortunate that 33% of total graduate student support is generated from extramural fellowships in this manner.

In summary, exposure to, and practice in, research, teaching, writing, and making presentations lay the groundwork for skills needed by future faculty. Motivated graduates who refine these skills as postdoctoral scholars are outstanding candidates for academic positions.

The evidence presented in this section documents that the Schools of Dentistry, Medicine, Nursing, and Pharmacy, as well as the Graduate Division, are developing opportunities for interprofessional education for their students. The improvements noted in UCSF's learning environment, and particularly in our technology services, have helped make these opportunities more accessible and better known to the students. In addition, the schools have done exploratory work to identify barriers that hamper students who might be considering academic careers, and have responded by encouraging and supporting students in their career plans. Each of the schools provides learning opportunities where students can explore career possibilities and begin to

acquire the knowledge, skills, and experience in research and teaching to prepare them for academic careers in the health professions.