The Costs of De Anza College Nursing Program Expansion

In recent years it has become clear that the Silicon Valley faces a shortage of Registered Nurses. According to the Silicon Valley Joint Venture 2005 report, approximately 615 jobs become available each year but the area only produces about 224 new nurses each year. According to the California Employment and Development Department, Santa Clara County will see annual average employment of Registered Nurses increase from 10,880 to 12,590 from 2001 to 2008. According to the June 2004 issue of Urologic Nursing, foreign born workers have accounted for a significant portion of the increase in the nursing workforce in recent years. Researchers at San Jose State University have concluded that the shortage is likely to continue due to an aging workforce and increased demands on the health care system in California and the Silicon Valley ("Nursing school curricula and hospital-based training programs," AORN Journal, Dec, 2002, by Rick P. Ward, and Collen Saylor).

To fill the gap in nursing employment, health care facilities have turned to signing bonuses, registries (long term temps), and short term placements ("travelers"). The Sutter Health Care System in Sacramento recently examined its expenditures for Registry and Temporary workers before heading off to a recruiting trip to London. To fill some 273 R.N. vacancies in 2003, Sutter estimated it spent more than 30 million dollars annually. Given these figures the Sutter Board determined that an approximately 1.5 million dollar annual investment over the next 10 years to produce additional R.N.'s from the local labor market would be a wise investment.

The current cost of the De Anza College Nursing program and the basis for expansion estimates, can be broken into 3 main categories: Direct Instructional Costs, Student Services Support, and Facilities and Technology Ongoing Support. While the Direct Instructional Costs can be determined from the financial accounting system, other costs associated with running a nursing program must be estimated.

Direct Instructional Costs

The current nursing program at De Anza College accommodates 24 students into the program each quarter. Cohort size is restricted by clinical placements which are limited to groups of 12 students in the hospitals. As the cohort size increases to 30, it is necessary to add a clinical rotation group, resulting in 3 groups of 10 students each. The benefit from the approach is a smaller clinical rotation group; the cost is in terms of an additional clinical assistant needed to help supervise the students. The lecture classes can accommodate some additional students with no increase in costs.

In 2003-04 the Nursing Program utilized the support of 8 FTES full time faculty (including the Program Director with ¼ teaching and ¾ administrative responsibilities, and the Assistant Program Director at ¼ FTE) and 4 FTES of part time faculty and staff. Salaries and benefits amounted to nearly 1.2 million dollars. The costs are associated

with running 6 cohorts of 24 students for each of 3 quarters (fall, winter, spring) simultaneously. In addition to required nursing courses, the program offers a nursing career pre-requisite and other supporting coursework (e.g. for students transitioning from an LVN).

In addition to faculty oversight, the Nursing Program at De Anza College also draws on the support of the Division Dean and Division Administrative Assistant. Operating expenses for supplies and materials are also needed to support instructional activities. These additional costs are estimated at $100,000 per year.

The Nursing Program at De Anza College is approximately 119 units in total. Of that total, 64 units or more than half of the coursework is in nursing courses (see Figure 3 for a list of nursing courses). The other Pre-Requisites and GE Courses account for 55 units. These courses include Microbiology and Human Anatomy/Physiology that must be taken prior to entry into the Nursing Program. The cost of these Pre-Requisites and GE Courses is not considered in this estimate. Since the District is self insured, the Nursing Program is not required to buy Malpractice Insurance for students working at clinical sites.

A typical schedule for a student in the Nursing Program would include one 4 hour theory class, 15 hours of clinical lab (two days a week), and perhaps another supporting lecture class. Units for lab hours are calculated on a 3/1 ratio so that a student will receive 5 units of credit for each 15 hours of clinical activity.

A typical full time faculty load for a quarter would include teaching a 4 hour theory class as well as supervision of 15 hours of clinical for a total of 19 instructional hours per week.

Student Support Services

Student Support Services, for such functions as the Records Office, Counseling, and College Administration, are not included in the nursing department budget. These expenses accounted for about 30% of the De Anza College State Funding (14) budget in the fiscal year ending in 2004. 30% of 1.2 million is $360,000 that must be considered as the college's overhead for housing the Nursing Program. As the cohort size and costs increase, this rate should be applied as the program would not be able to function without student support services.

Facilities and Technology

Technology costs include computer hardware and software, access to campus networks and the cost of maintenance. These costs are included as Foothill De Anza Community College District (FHDA) budgets, but should be included as a necessary component of the Nursing Program. About 13% of FHDA state expenditures go towards technology costs. At 15% of 1.2 million, this would be an additional $180,000 necessary to support the program.

Facilities costs are estimated at $2 per square foot per month. The Sutter Center for Health Professions currently leases 27,000 square feet. At $2 this would generate an annual cost of $648,000 per year in potential lease payments. Recent Measure E renovations of the S-7 building where the Nursing Program is housed totaled to $780,000 for about 7,200 assignable square feet. Ongoing upkeep of the facilities is estimated at 5% a year for a total of $60,000.

To augment clinic instruction, it is possible that 25% of a students' clinical experience can come from a simulation lab. A simulation lab would have as many as 8 mannequins designed to provide learning opportunities using computer-adaptive instruction. Essentially, the mannequins can be programmed to develop mastery of a range of skills. The initial cost of such a lab is estimated at $250,000 per year. The ongoing technical support and maintenance of such a lab is estimated at $100,000 per year.

Expansion of the Program

For De Anza College, expanding the number of nursing students admitted over a 3 year period from 216 (9 academic year quarters times 24 students) to 360, or 144 new students, would require additional resources. At a 75% two-year graduate rate, the 144 additional students would yield 108 new Nursing graduates over a 5 year period (see Figure 2 for a cohort tracking analysis. To increase the number of Nurses over this period from 162 by 108 to 279, a 2/3^{rds} increase, would require De Anza College to modify its Nursing Program in two ways.

1) **Increase the cohort size from 24 to 30**. This would require hiring the equivalent of 2 FTE clinical assistants (5 more part timers each quarter – additional clinical support is not needed for the 6th quarter of the program) with an estimated annual cost of $85,000.

2) **Offer 3 summer cohorts that would receive year-round instruction**. Starting in the 3rd summer, the Nursing Program would be serving 2 cohorts of 30 additional students each quarter, in addition to the current 6 cohorts. As the students cycle through, the new / incremental costs occur for summer instruction and administration as well as clinical supervision during the academic year quarters. It is assumed that academic quarter lecture would not rise but some additional support for program oversight during the academic year would be needed – estimated at an additional $66,000.

For the first summer of the program (2006), 1 theory and 3 clinical faculty members (one per each cohort of 10 but one of the 3 can be a clinical assistant rather than a regular part-time instructor; also one of the 3 clinical instructors could be the theory instructor) would be needed. Beginning in 2007 this would double to 4 clinical and 2 theory faculty members. Since only the clinical faculty members are needed during the academic year quarters, the approximate FTE

would be 3, with an approximate cost of $300,000 annually. In addition an Assistant Director would be needed during the summer – 1/3 FTES or $33,000.

In addition to the Nursing Program faculty, the following would be needed for the program from the hospitals or other clinical setting:

a) 3 additional sites for 12 week rotation with 10 placements each starting summer 2006.
b) 6 additional sites with 10 placements each starting summer 2007, per the schedule.

These additional sites will impose some cost on the hospitals. Since hospital nursing staff will be impacted, the cost for each site, at 15 hours per week at $60 per hour, would be estimated at $43,200.

Given the economies of scale present in expanding the current program, expanding the number of graduates by 2/3^{rds} requires an approximate increase in Nursing Program expenditures by 1/3rd (see Figure 1 below).

Figure 1
Estimated Annual Costs of the De Anza College Nursing Program

Support Type	Base Costs		Cohort +6	Summer Cohort	Total New
Instructional	1,300,000		85,000	350,000	527,200
Student Support Services	360,000		0	105,000	105,000
Facilities and Technology					
Tech Support	180,000		0	52,500	52,500
Facilities Maintenance	60,000		0	17,500	17,500
Students Served	216				344 (144 new)
	$1,900,000				$702,200
Other (not incl in total)					
Sim Lab Startup	250,000				
Sim Lab Ongoing	100,000				
Lease Ongoing	648,000				
Pre-Req Coursework					

Note: To accommodate inflation, figures should be increased by 4% per year.

Figure 2

De Anza College Nursing Program Expansion
Cohort Tracking Analysus from Winter 2006 thru Spring 2010

Fiscal Year	Summer Quarter — Cohort	New	Total in Classes All	Fall Quarter — Cohort	New	Total in Classes All	Winter Quarter — Cohort	New	Total in Classes All	Spring Quarter — Cohort	New	Total in Classes All
2005-06							C1	30	180	C2	30	180
2006-07	S1	30	30	C3	30	210	C4	30	210	C5	30	210
2007-08	S2	30	60	C6	30	240	C7	30	210	C8	30	210
Potential Gaduates				C1		30	C2		30	C3		30
				S1		30						
2008-09	S3	30	60	C9	30	240		30	210		30	210
Potential Gaduates				C4		30	C5		30	C6		30
				S2		30						
2009-10		30	60		30	240		30	210		30	210
Potential Gaduates				C7		30	C8		30	C9		30
				S3		30						

De Anza College Nursing Program Expansion Summary
Cohort Tracking Analysus from Winter 2006 thru Spring 2010

Cohort Type	Cohort Number	Total Students	Graduates in 2 Years (75%)
Current	9 Cohorts of 24 Students	216	162
Inc to 30	9 Cohorts of 6 Students	54	41
Summer	3 Cohorts of 30 Students	90	68
	Total New	144	108
	Combined Total	360	270

By the 3rd year of the program expansion, the Nursing Program would be serving 48 additional students per year. De Anza College will receive approximately $3,600 per student per year or $172,000. Part of these funds will be needed to defer the cost of Pre-Requisite courses for these additional students. However, perhaps as much as $100,000 in revenue would be available to the College for Nursing Program costs, including instructional, student support services, and Facilities/Technology.

Figure 3

De Anza College Nursing Courses 2004-05

Typical Quarter Taken	Course	Title	Type
Q1	NURS054B	PHARMACOLOGY I	LEC
Q1	NURS54AL	FUND NURS:NON,SUB-AC CLI	LAB
Q1	NURS54AR	FUND NURS:NON-ACUTE,SUB-	LEC
Q2	NURS054D	PHARMACOLOGY II	LEC
Q2	NURS54CL	ACUT FUND/MED SURG I	LAB
Q2	NURS54CR	ACUT FUND/MED SURG I	LEC
Q3	NURS54EL	PERINATAL NURS CLINICAL	LAB
Q3	NURS54ER	PERINATAL NURSING	LEC
Q3	NURS54FL	PEDIATRIC NURSING CLINIC	LAB
Q3	NURS54FR	PEDIATRIC NURSING	LEC
Q3	NURS54GL	PHARM III LABORATORY	LAB
Q3	NURS54GR	PHARMACOLOGY III	LEC
Q3	NURS54HR	MED/SURG APPLIC I	LEC
Q4	NURS54IL	MED/SURG II:CRE OLDR ADL	LAB
Q4	NURS54IR	MED/SURG II:CRE OLDR ADL	LEC
Q4	NURS54JR	MED/SURG APPLIC II	LEC
Q5	NURS054K	PSYCH/MNTL HLTH NURS	LEC
Q5	NURS54KL	PSYCH/MNTL HLTH CLINICAL	LAB
Q5	NURS54LL	LDRSHP/MGMT NURS CLINICL	LAB
Q6	NURS054L	LEADRSHP/MGMT IN NURSNG	LEC
Q6	NURS100.	REV NURS CONCEPTS	LAB
Q6	NURS100Y	REV NURS CONCEPTS	LAB
Q6	NURS54LL	LDRSHP/MGMT NURS CLINICL	LAB
QO	NURS050.	CAREER OPPRTN/NURSING	LEC
QO	NURS125C	ADV MED SURG PRAC II	LAB
QO	NURS150.	NURSING LAB SKILLS	LAB
QO	NURS150W	NURSING LAB SKILLS	LAB
QO	NURS500.	NURS LAB SKILLS	LAB
QO	NURS81NL	CNA TRANS CLINICAL	LAB