Determining Costs of Educational Programs: A Report Prepared by the AACP Institutional Research Advisory Committee

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Academic institutions, including colleges of pharmacy, are often required to analyze the costs of their educational programs. This has become particularly evident for colleges planning the implementation of entry-level PharmD programs. The Institutional Research Advisory Committee of AACP has considered ways to assist member colleges in conducting cost analysis of their programs and has prepared this report on cost analysis methods for use by interested colleges. The purpose of this report is to briefly describe some of the commonly used strategies and, when appropriate, underscore the advantages and limitations of each of these strategies. Examples illustrating each of the strategies are also presented. It is important to emphasize that these examples should not be used as estimates of pharmacy education program costs but rather as models to be used by colleges to estimate the costs of their own programs.

Several strategies exist for calculating costs of educational programs. The results of program cost analysis are usually used for establishing budgets for academic units or setting tuition rates. Retrospective analysis of the expenditures of academic units is the most commonly used strategy for determining costs of existing academic programs. However, projections of educational costs are often used to estimate costs of new programs. Such projections must be based on assumptions that are supported by historic expenditure patterns.

Analysis of educational costs is not an "exact science." The analysis is often based on a number of assumptions, and the validity of the results will depend on the quality of these assumptions. Retrospective cost analyses reflect a spending profile of fiscal resources that were available during the specified time period. They provide useful data on how resources were used, but do not provide information as to the quality of the programs analyzed or the wisdom underlying the decisions that produced the results. However, educational cost analysis can serve as a useful management tool, as long as the assumptions used in generating the data are well understood and their limitations are taken into account. In any case, it should be remembered that instructional costs are merely an estimate and nothing more or less. Also, while one-year "snapshots" of program costs can be useful, anomalies occurring during a particular year can produce misleading results. Analysis over a three to four-year period will reveal truly unusual or abnormal trends.

Program costs are normally expressed as dollars per specific units of instruction. It is extremely important to clearly define the units of instruction used in expressing costs. Commonly used units of instruction include "per student," "per FTE student," "per student credit hours," or "per annual average student credit hours". Comparisons of program costs that do not take into account the precise definition of the units used are invalid and meaningless.

Educational costs are usually categorized as "Direct Costs" and "Indirect Costs." Direct costs are those directly associated with providing instructional activities, such as faculty, staff and graduate student salaries; fringe benefits; operation expenses; as well as other instruction-related costs such as admissions, student registration, and other student services. The indirect costs include all other costs required to provide services and establish and maintain the facilities to conduct the educational program. The indirect costs may include amortization of costs of buildings, cost of leasing space, operation and maintenance of physical plant, utilities, libraries and general institutional administration. Indirect costs are often institution specific. For instance, the indirect costs in a private institution may include the costs of buildings and other physical facilities as well as assessed state and local taxes. Indirect costs in a public institution usually do not include costs of capital projects. In this report we will discuss instructional direct costs only. However, it should be understood that total program costs are much greater than direct costs only and may be as much as twice the amount of direct costs. Further, the illustrations included in this report describe only the direct costs associated with instruction offered by a college of pharmacy. Costs of instruction offered by other academic units, *e.g.,* chemistry, physiology, microbiology, are not included in these illustrations. However, similar strategies could be used to determine these costs.

STRATEGIES FOR RETROSPECTIVE COST ANALYSIS

Unit Cost Strategy

This is the simplest and most commonly used strategy for estimating educational program costs. The strategy is especially useful in comparing costs of various units within the same institution and in comparing units that have a similar mission and profile of activities.

In calculating "Unit Cost" one simply divides total annual expenditures of the academic unit, or a subset of the units' activities, by the total number of units of instruction (*e.g.,* enrollment, student FTE) that benefitted from these activities. Therefore, "Unit Cost" may be a very general parameter reflecting the "total expenditure ($) per student enrolled" or a relatively specific estimate, *e.g.,* "expended faculty salary per FTE student."

The degree of specificity attained in calculating unit cost is dependent on the level of sophistication of the institution's accounting system. In most institutions, expenditure figures are available in broad categories, *e.g.,* Faculty Salaries, Graduate Student Salaries, Fringe Benefits, Travel, and Goods and Services.

Unit cost estimates provide relatively accurate program costs in colleges that have a single mission, e.g., provide instruction for PharmD students. However, unit cost estimates are much less valuable in institutions that have multiple missions and are en-

gaged in a variety of different activities, *e.g.*, instruction to students in professional programs and graduate programs; research; patient care; and public service. In such cases, the "Unit Cost" is an overall aggregate for the unit that does not reflect the true cost of each of the programs involved.

Illustration 1

A fictitious college of pharmacy will be used for this illustration. This college offers the Bachelor of Science in Pharmacy, the postbaccalaureate PharmD. and MS and PhD in Pharmaceutical Sciences. The following is a summary of FY '93 expenditures and enrollments:

FY 93 Expenditures		
Salaries		
Faculty	$ 987,241	
Graduate Assistants	62,976	
Staff	283,233	
Subtotal Salaries		$1,333,450
Operation		
Wages	21,084	
Travel	30,721	
Goods and Services	147,460	
Computing	10,027	
Telephone	16,224	
Equipment	141,283	
Subtotal Operations		366,799
Fringe Benefits		295,935
Sponsored Programs		
Grants and Contracts	2,287,304	
Research Support (ICR)	106,731	
Subtotal Sponsored Programs		2,394,035
Self-Sustaining Centers		
Vivarium	127,402	
Drug Information Center	62,725	
Continuing Education	46,912	
Subtotal Self-Sustaining Centers		237,039
Total Expenditures		$4,627,258
Enrollment Academic Year 1992-93		
Student Credit Hours		
Undergraduate	5,760	
Adv. Professional (PharmD)	512	
Graduate	720	
Total Student Credit Hours		6,992
Head Count		
BS Pharmacy program	180	
PharmD program	16	
Graduate program	30	
Total Head Count		226
Student FTE[1]		
BS Pharmacy program (student credit hours/30)	192.0	
PharmD program (student credit hours/24)	21.3	
Graduate program (student credit hours/24)	30.0	
Total Student FTE		243.3

"Unit Cost" Calculations

Using total expenditures, which includes sponsored programs and self-sustaining centers, in "Unit Cost[1]" calculations would be misleading. It would be more meaningful to use the total of "Salaries," "Operations" and "Fringe Benefits" in the calculation. One may use Student Credit Hours, Head Count, or Student FTE as the unit of cost as follows:

Instruction related expenditures (Salaries, Operations, Fringe Benefits) = $1,996,184

$$\text{Cost/Student Credit Hour} = \frac{\$1,996,184}{6,992} = \$285.50$$

$$\text{Cost/Student} = \frac{\$1,996,184}{226} = \$8,832.67$$

$$\text{Cost/Student FTE} = \frac{\$1,996,184}{243.6} = \$8,204.62$$

This illustration demonstrates the ease of calculating the "Unit Cost" for an academic program. However, it also underscores the lack of specificity of the calculated cost figures. As mentioned earlier, this figure is an overall average of the aggregate costs of all degree programs offered by this college, and does not represent accurately cost at any level of instruction.

The Unit Cost Strategy is, in economic terms, referred to as an *Average Cost Strategy* which divides total costs by total units. The average cost is a useful statistic for comparing costs of programs with similar characteristics. Academic planners often rely on a different statistic, *Marginal Cost,* to determine whether program expansion or contraction should take place. This approach determines the cost of producing "one additional unit" by the organization. Thus, the cost of educating one additional baccalaureate student would be less than the Unit Cost/Average Cost because fixed costs (library, tenured faculty, administrator salaries, etc.) would already be provided and only variable costs (laboratory supplies, contracted preceptors, etc.) would be required. The marginal cost is less than the average (unit) cost in most programs and this provides an incentive to expand enrollments. Reliance upon marginal costs can lead to problems, including excessive teaching assignments, crowding, and diversion of resources and faculty time from other programs. Long-term planning is best made by relying upon Unit Cost or Average Cost data. Short-term planning can often benefit from marginal cost analysis. It is very important, however, that administrators not rely upon marginal cost analyses for short-term planning that then results in adverse long-term effects. For a more detailed discussion of this matter readers may wish to consult AACP's Academic Management System, chapter on Program Accounting by Dr. G. Joseph Norwood.

Cost Allocation Strategies

Collegiate units often engage in an array of activities such as undergraduate, professional, and graduate instruction; continuing education: research; public service; and patient care. It would be useful to estimate the approximate annual cost of each of these activities. These estimates would provide unit administrators with an understanding and appreciation of the approximate "relative shares" of the annual, expenditures that relate to each of these programs. The majority of the cost allocation strategies are based on an analysis of faculty activities to distribute faculty work load and associated costs to specific programs and activities.

Academic Health Centers Cost Allocation Strategy. A national effort to estimate the costs of health sciences academic programs was initiated in 1971-72 using methods pioneered by August J. Carroll. Forty-one academic health centers participated in an extensive "Cost Allocation Study." Since then, many of these centers have periodically updated their cost estimates. Faculty and staff in health sciences units often work in what was termed by Carroll a "Joint Product Environment" in which instruction, research, and service activities may benefit more than one "end-purpose program." Therefore, he developed a strategy to allow faculty to report annually, on an individual basis, their best estimates of the percent-of-time spent on each of the "end-purpose programs."

Institutions using the "Cost Allocation" strategy ask faculty to report on special forms their estimate of the time (in hours per

[1] An FTE equals 30 student credit hours for undergraduate students and 24 student credit hours for PharmD and graduate students.

Table I. Percent effort allocation to each program

Faculty and staff	Prof. yrs. 1&2	BS experiential	PharmD	MS/PhD	Post-doctoral	C.E.	Other undergraduate	Total	Research	Patient service	External prof. services
Administrative classes	18.8	4.6	12.2	25.9	7.5	1.5	0.4	70.9	19.1	2.2	7.7
Professional	14.0	0.6	5.9	24.6	12.6	3.2	0.9	61.8	27.1	4.9	6.3
Research classes	4.7	0.0	0.0	0.0	0.0	0.0	0.0	4.7	95.3	0.0	0.0
Student Service classes	17.4	1.2	4.3	29.1	0.0	0.0	0.0	52.0	33.7	14.3	0.0
Student Fellow classes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Other Academic classes	0.5	1.1	1.1	2.1	0.0	0.0	0.0	4.8	64.0	0.0	31.2
Civil Service classes	14.2	6.1	15.1	9.8	6.8	2.3	0.0	54.2	28.5	0.4	16.9

Table II. Allocation of expenses to educational program direct costs

Expense item	Total expenses	Prof. yrs. 1 & 2	BS experiential	PharmD	MS/PhD	Post-doctoral	C.E.	Other undergraduate	Total	Research	Patient service	External prof, services
Salaries												
Administrative classes	$ 596,402	$112,280	$27,564	$72,909	$154,173	$44,889	$8,720	$2,670	$423,745	$113,899	$ 12,988	$ 45,770
Professional	1,635,472	228,447	10,403	96,834	402,107	206,016	52,810	13,955	1,010,572	442,482	79,514	102,904
Research classes	30,800	1,433	0	0	0	0	0	0	1,433	29,367	0	0
Student service classes	918,924	159,973	10,827	39,523	267,209	0	0	0	477,532	309,922	131,470	0
Student fellow classes	10,500	0	0	0	0	0	0	0	0	10,500	0	0
Other academic classes	103,500	546	1,092	1,092	2,184	0	0	0	4,914	66,269	0	32,317
Civil service classes	613,457	86,865	37,392	92,337	60,360	41,518	13,789	0	332,261	174,607	2,662	103,927
Subtotal salaries	3,909,055	589,544	87,278	302,695	886,573	292,423	75,319	16,625	2,250,457	1,147,046	226,634	284,918
Percent	100	15.1	2.2	7.7	22.7	7.5	1.9	0.4	57.5	29.3	5.8	7.4
Fringe Benefits	856,983	123,538	21,986	75,684	178,119	84,096	21,660	4,781	509,864	237,723	27,368	81,938
Total Salary Expense	4,765,948	713,082	109,264	378,379	1,064,692	376,519	96,979	21,406	2,760,321	1,384,769	254,002	366,856
Percent	100	15	2.3	7.9	22.3	7.9	2.0	0.4	57.9	29.1	5.3	7.7
Operations	1,863,329	281,018	41,603	144,286	422,602	139,389	35,902	7,925	1,072,725	546,762	108,030	135,812
Percent	100	15.1	2.2	7.7	22.7	7.5	1.9	0.4	57.5	29.3	5.8	7.4
Total Direct Expenses	6,629,277	994,100	150,607	522,665	1,487,294	515,908	32,881	29,331	3,833,046	1,931,531	362,032	502,668
Percent	100	15	2.3	7.9	22.4	7.8	2.0	0.4	57.8	29.1	5.5	7.6
Enrollment	219	93	32	84	91							
Cost/student	$4,539	$1,619	$16,333	$17,706								

week) they spend on each of the college programs (see Appendix). Cooperation of the faculty is essential in obtaining relatively accurate and complete data. Based on these effort reports, a corresponding fraction of each faculty member's salary is allocated to each program or activity. All other direct and indirect expenses of the collegiate unit are allocated to each of the "end-purpose programs" in the same proportion as that of faculty salary allocation. Collegiate units participating in the national "Cost Allocation Study" report program costs as cost in dollars per enrolled student. The University of Minnesota Health Sciences Center is a participant in the "Cost Allocation Study" program, and educational cost estimates reported by the College of Pharmacy are generated using this strategy.

Illustration 2

A second fictitious College of Pharmacy is located in a health sciences center and is a participant in the National "Health Sciences Cost Allocation Study." Each member of the faculty and staff in the college was asked to complete an effort report form. The completed reports were analyzed and the results are reported in Table I. College expenses were allocated to each of the college

programs based on effort allocation reported by faculty (Table II).

Using this strategy, it is possible to allocate other expenses to each of the college's programs (Table II). Note that non-salary expenses. Operations in this illustration, are allocated in proportion to the percent of salaries allocated to each program.

Educational Costs Based on the Costs of Individual Courses. Many alternatives to the "Health Sciences Cost Allocation Study" are used to estimate educational costs of pharmacy programs. At Washington State University, educational costs are estimated based on the "Faculty Activity Analysis Report" submitted by each collegiate unit. For each course offered by the college, the report lists the name and number of hours spent "in class" and "outside class" by every faculty and teaching assistant participating in instruction. Instructional costs for each course are calculated using the university accounting system and course enrollment data.

The direct instructional cost for each course is the sum of the cost of salaries and fringe benefits of faculty and teaching assistants, plus other direct expenses. Faculty and TA salary and fringe benefits costs are estimated from the sum of "hours in class" plus "hours outside class" divided by 40 and multiplied by the actual full-time salary and fringe benefits during the period in which the course was offered. Other direct instructional expenses such as Goods and Services, Computing, Wages, and Instruction-Related Travel, are calculated as a fraction of the total college costs for these items prorated at the same ratio of the courses" faculty salaries to total college faculty salaries. Other instruction- related costs such as student services and administration are similarly calculated. The educational costs of an academic program are calculated as the sum of the estimated costs of instruction for each of the courses offered for credit as part of the educational program.

Illustration 3

The fictitious college of pharmacy described in Illustration 1 decided to determine the educational costs of its BS in pharmacy program using the course cost strategy. Enrollment in the baccalaureate program averages 60 students in each of the three classes (1st. 2nd and 3rd professional years). The average annual credits, *i.e.,* the sum of the credits offered in the Fall and Spring semesters divided by 2, is used in the calculation because faculty annual full-time salary is used as the basis for determining costs. To fulfill the requirement for the baccalaureate, students must complete 73 semester credits of didactic work and 24 weeks of experiential work. The didactic work includes:

- 52 semester credits or 26 annual average credit hours of required core courses.
- 12 semester credits of electives. The college offers 24 semester credits, or 12 annual average credit hours, of, elective courses to allow students to elect 12 semester credits (6 annual average credit hours).
- 9 semester credits of laboratory or small group sessions. For these courses the class is divided into two sections. Student spend three hours in the laboratory for each credit hour.

The experiential work involves 8 weeks of clerkship and 16 weeks of externships. The student to faculty ratio in clerkships is 2:1. Faculty are required to have 10 contact hours per week with the five students assigned to them. The student to faculty ratio is 1:1 in externships. The faculty, primarily volunteer faculty, spend on the average five hours per week with students.

Calculation of Faculty FTEs Involved in Teaching Required Core Courses (*26 annual average credit hours*)*:* Each annual average credit requires 1 hour per week in the classroom and 3 out-of-class hours for a total of 104 hours per week, the equivalent of 2.6 faculty FTEs (*i.e.*, 104/40 = 2.6).

Calculation of Faculty FTEs Involved in Teaching Elective Courses (*6 annual average credit hours required and 12 annual average credit hours offered*)*:* Twice as many courses are offered to give students a choice, thus effectively doubling the number of contact hours. Each annual average credit requires 1 hour per week in the classroom and 3 out-of-class hours for a total of 48 hours per week, equivalent to 1.2 faculty FTEs (*i.e.*, 48/40 = 1.2).

Calculation of Faculty FTEs Needed to Teach Required Laboratory and Small Group Seminars (*4.5 annual average credit hours*)*:* The class is divided into two sections. Each credit requires 3 hours per week in the laboratory and 3 out of class hours for a total of 54 hours per week, equivalent to 1.4 faculty FTEs (*i.e.,* 54/40 = 1.4).

Calculation of Faculty FTEs Needed for Clerkships: The student to preceptor ratio is 2:1. Therefore, the number of preceptors required is 10. Number of faculty contact hours per week is 10 for a total of 100 contact hours per week, equivalent to 2.5 faculty FTEs (*i.e.*, 100/40 = 2.5).

Calculation of Faculty FTEs Needed for Externship: The student to preceptor ratio is 1:1. Therefore, the number of preceptors needed is 40. Each preceptor spends 5 hours per week with students for a total of 200 faculty contact hours per week, equivalent to 5 faculty FTEs. These are primarily volunteer faculty.

Calculation of Teaching Assistant FTEs Needed: The laboratory classes are held for 27.0 hours per week. Three (3) teaching assistants are required in the laboratory for a total of 81 contact hours per week. Teaching assistants require one hour of out-of-class time for each one hour in-class time for a total of 162 teaching assistant hours per week, equivalent to 4.0 teaching assistant FTEs (*i.e.,* 162/40 = 4.0).

Calculation of Staff FTEs Needed: One support staff FTE is required per 8 instructional faculty FTEs for a total of 1.4 staff FTEs.

Calculation of Academic Administration FTEs: It is estimated that 0.25 dean FTE and 0.25 assistant dean FTE are required for the baccalaureate program. One staff FTE is required to support administration of programs.

Calculation of Costs of Operation: Total costs of operation for the college are prorated at the same fraction of faculty salary.

Estimated Costs of BS in Pharmacy Program

Salaries	FTE	Salary[2]	Costs
Administration	0.5	$ 52,500	
Instructional Faculty[3]	7.7	381,895	
Staff	2.4	72,000	
Teaching Assistants	4.0	72,000	
Subtotal Salaries			$578,395
Employee Benefits (@ 26% of Salaries)			$150,383
Operations			$171,562
Total Direct Costs			$900,340
Enrollment (Students)			180
Cost per Student[4]			$5,002

Strategies for Projections of Education Costs

It is often necessary to project the education costs of new or expanded programs. This is the situation that many colleges of pharmacy are facing today in planning for converting to the all-PharmD professional programs. Fortunately, some colleges of pharmacy have been willing to share their historic cost analysis data for the PharmD and BS programs, *e.g.,* University of Minnesota. These data can serve as the basis for comparing relative program costs and validate estimates prepared by other colleges. However, it is important to identify the specific strategy that was used for arriving at program costs and consider its limitations.

It is more often the case that colleges are required to develop

[2]Salaries represent actual salaries of faculty involved in instruction.

[3]Does not include volunteer faculty.

[4]Does not include cost of time donated by volunteer faculty.

a budget for a proposed program that is based on their local institutional policies. In these cases it is useful to link the budget for the proposed program to that of similar existing programs within the institution. In developing a budget for a new or an expanded program, one can use strategies similar to those described for retrospective program cost analysis. Determining the additional costs that will be incurred as well as the projected total costs is also useful. The degree of sophistication used will depend on the anticipated level of scrutiny of the proposed budget. If it is anticipated that the proposed budget will receive little scrutiny, it may be possible to calculate "unit cost" for the proposed program based on historical information and anticipated enrollment. However, if program cost projections will be subjected to critical analysis, it may be necessary to provide rational justification of each element of the proposed budget, and a systematic cost projection strategy must be used. Development of a budget for a new or expanded program should also include an analysis of the impact the program change would have on revenues. Two examples of systematic cost projection analysis are presented here for consideration by interested colleges.

A systematic process for developing cost estimates of an entry-level PharmD program was proposed by Taylor *et al* at the University of Illinois at Chicago College of Pharmacy. These authors developed a spreadsheet program to calculate the resources required for entry-level PharmD programs based on the number of students and desired student to faculty ratio. The authors appear to be willing to assist colleges who are interested in using their method for cost analysis.

Another systematic process for projection of program costs is based on allocation of faculty costs to each course or group of similar courses in a proposed program. This approach is similar, in principle, to the strategy previously described for retrospective cost analysis. Simply stated, the total cost of the educational program will equal the sum of the costs of each of its educational components and courses, plus other instruction-related costs such as student services and administration. The cost for each course is based on the cost of salaries for faculty and teaching assistants and is calculated based on the number of hours that instructors are expected to spend inside and outside the classroom.

Illustration 4

A college of pharmacy is about to convert its professional pharmacy program to a single entry-level PharmD program. A systematic process was used for estimating the instructional costs of the proposed program. The estimated costs are based on the following assumptions which are consistent with the proposed program.

1. Enrollment will be 72 students per class.
2. Graduation will require a minimum of 103 quarter credits (69 semester credits) of prepharmacy courses and 198 quarter credits (132 semester credits) in the professional program for a total of 301 quarter credits (201 semester credits).
3. 172 of the 198 quarter credits (115 of the 201 semester credits) in the professional program will be taught by college of pharmacy faculty, with the remaining 26 quarter credits (17 semester credits) being taught by other departments in the health sciences. These 172 quarter credits (115 semester credits) will be distributed as follows:
   a. 25 annual average credit hours[5] of lectures in required core courses;
   b. 10 annual average credit hours of lectures in required elective courses;
   c. 4.3 annual average credit hours of conferences in required core courses;
   d. 1 annual average credit hour of laboratory in required core courses;
   e. 6 annual average credit hours of required practicum; and
   f. 1 annual average credit hour of special projects.

Calculation of Faculty FTEs Needed to Teach Required Core Courses (*25 annual average credit hours*). Each annual average credit requires 1 hour per week in the classroom and 3 out of class hours for a total of 100 hours per week, the equivalent of 2.5 faculty FTE (*i.e*, 100/40 = 2.5).

Calculation of Faculty FTEs Needed to Teach Required Elective Courses (*10 annual average credit hours*). At least twice as many courses must be taught since not all students take the same electives, thus effectively doubling the contact hours. Each annual average credit requires 1 hour per week in the classroom and 3 out of class hours for a total of 80 hours per week of student contact time, the equivalent of 2.0 faculty FTEs (*i.e*., 80/40 = 2.0).

Calculation of Faculty FTEs Needed to Teach Required Core Conferences (*4.3 annual average credit hours*). The class will be divided into four sections to maintain effective teaching, thus effectively quadrupling the contact hours. Each average annual credit requires 2 hours per week in the classroom and 6 out of class hours for a total of 137.6 hours per week of student contact time, the equivalent of 3.4 faculty FTEs (*i.e*., 137.6/40 = 3.4).

Calculation of Faculty FTEs Needed to Teach Required Laboratories (*1.0 annual average credit hour*). The class must be divided into four sections to maintain effective teaching, thus effectively quadrupling the contact hours. Each average annual credit requires 3 hours per week in the laboratory and 3 out of class hours for a total of 24 hours per week of student contact time, the equivalent of 0.6 FTE faculty (*i.e.,* 24/40 = 0.6).

Calculation of Faculty FTEs Needed to Teach Required and Elective Practicums (*16 annual average credit hours*). Assume that for the experiential courses, the student to faculty ratio is 2:1. Also assume that faculty will have 30 contact hours per week with the two students assigned to them for 40 hours-per-week rotations. For 72 students, the total contact hours per week is 1080 hours, the equivalent of 27 faculty FTEs (*i.e.,* 1080/40 = 27.0).

Calculation of Faculty FTEs Needed to Supervise Student Projects (*1 annual average credit hour)*. Assume two hours per week per student. For 72 students, the total contact hours per week is 144 ours, the equivalent of 3.6 faculty FTEs (*i.e.,* 144/40 = 3.6).

Total instructional faculty required = 39.1 faculty FTEs.

Estimated Annual Program Costs

Average Cost	FTE	Cost per ETE	Cost
Salaries			
Academic Administrators	1.0	—	$ 100,000
Instructional Faculty	39.1	$58,000	2,267,800
Classified Staff	7.0	30,000	210,000
Teaching Assistants	6.0	18,000	108,000
Salaries Total			2,685,800
Operations (@ 15% of Salaries)		402,870	
Fringe Benefits (@26% of Salaries)			698,308
Total Direct Costs			3,786,978

Administrative costs are calculated at 0.5 FTE dean at $130,000 and 0.5 FTE associate dean at $70,000.

Classified staff at 1.0 FTE for each of the two administrators and 1.0 for every 8 faculty FTEs.

CONCLUSION

Several strategies exist for calculating costs of educational programs. In this report examples of the unit cost strategy, cost

[5] An annual average credit hour is the sum of credits for a Fall and Spring semester divided by 2 or credits in the Fall, Winter and Spring quarter divided by 3.

allocation, and course cost strategy are described. These by no means are the only strategies that could be utilized for estimating program costs. However, they represent the most commonly used approaches to estimating educational program costs. Another strategy used by some states in setting college budgets is the "Formula Approach." An excellent description of this approach is presented in the chapter on "Guidelines for Budget Development and Control in Colleges of Pharmacy" authored by Dr. James T. Doluisio included in *The Academic Management System* published by AACP.

It is important to recognize that the described strategies address educational program costs and not total college budget. The college's budget should represent the total costs of all college programs.

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APPENDIX 1. COST STUDY

College of Pharmacy—Program Analysis, Fiscal Year 1987-88

Name: Signature:
Academic Rank:
Civil Service Class: Date Completed:

Program	Program Time Estimation (in whole hours per week) Patient care time essential to program	Research time essential to program	Instructional time—no patient care or research component	Administrative & other internal professional time essential to program	Total Program Time
Professional Programs					
First Two Years (BS and PharmD)					
BS Externship (Third Year)					
PharmD III					
PharmD IV					
Graduate Programs (M.S. and Ph.D.)					
Hospital Pharmacy					
Medicinal Chemistry					
Pharmaceutics					
Pharmacognosy					
Social and Administrative					
Pharmacy Post-doctoral					
Fellowships/Residency Programs					
PharmD					
Ph.D.					
Continuing Education					
Non-pharmacy Undergraduate Education[a]					
Research[b]					
Service to or on behalf of Patients					
Public and External Professional Service					
TOTAL					

[a] Courses taught to other University units.
[b] Exclusive of time reported in "programs" listed above this item.