FACULTY OUTPUT AND SALARY COSTS OF STATE-RELATED AND STATE-OWNED COLLEGES AND UNIVERSITIES

Staff Analysis of the Joint State Government Commission

MARCH 1979

FACULTY OUTPUT AND SALARY COSTS OF STATE-RELATED AND STATE-OWNED COLLEGES AND UNIVERSITIES

ANALYSIS OF REPORTS SUBMITTED

UNDER 1977 ACTS 11A, 27A, 28A, 29A AND 30A

Staff Report of the
Joint State Government Commission of the
General Assembly of the Commonwealth of Pennsylvania
Harrisburg, Pennsylvania
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FOREWORD

The General Assembly appropriated over $365 million toward the operation of the Commonwealth's 4 State-related universities, the State-owned university and the 13 State-owned colleges for the year 1977-1978. This impressive expenditure, reflecting the Legislature's commitment to providing higher education at a reasonable cost to students, averaged nearly $2,000 for each full-time student.

Aware of the need for improved accountability and continued evaluation, the Senate in 1972 for the first time inserted reporting requirements proposed by Senator Richard A. Snyder into the appropriation acts for the State-related universities. In 1976 the House of Representatives added similar reporting requirements to the State-owned colleges and university appropriation.

The reporting provisions mandate that the institutions submit annual information on faculty salaries, student credit-hour production and work-related activities.

In the yearly analysis of this data for the appropriation and education committees of both houses of the General Assembly, the staff

of the Joint State Government Commission relates the data on instructional costs and production to legislative and administrative goals. These goals include achieving

-- A diversity of educational programs at affordable instructional costs.

-- Cost efficient utilization of teaching faculty throughout the year in each department and at each level of instruction.

-- Faculty salaries in line with those of comparable faculty at other institutions.

-- Equitable Commonwealth appropriations that reflect the needs of the various institutions and the expectations of the taxpayers.

The staff employs a number of measures in analyzing instructional output and costs. The instructional output is measured by student credit-hour and degree production by level of instruction, term and department. The costs of this output are evaluated in terms of faculty salaries and Commonwealth appropriations.

The data which are summarized and evaluated in this report were submitted by the 18 institutions of higher learning in compliance with 1977 Acts 11A, 27A, 28A, 29A and 30A for the period from September 1, 1977 through August 31, 1978.

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Table of Contents

FOREWORD iii

SUMMARY OF FINDINGS 1

ANALYSIS OF FACULTY OUTPUT AND SALARY COSTS

Student Credit Hours and Degrees as Measures of Productivity 5

Lower-division undergraduate production
Upper-division undergraduate production
Graduate production
Academic year production
Summer term production
Degrees

Class Size 14

Faculty Classroom Contact Hours and Other Work-Related Activities 19

Components of faculty workweek
Total workweek

Faculty Salaries 24

Salary Cost per Student Credit Hour 27

Commonwealth Appropriations 31

APPENDIXES

A. Comparison of Student Credit Hours and Degrees, 1976-1977 and 1977-1978 35

B. Salaries of Selected White-Collar Occupations 36

C. Equalization of Student Credit Hours 37

D. Ranking of Faculty Salaries of U.S. Colleges and Universities 39

Summary of Findings

1. In line with national trends, the 1977-1978 student credit-hour and degree production at the majority of the Pennsylvania State-related and State-owned colleges and universities decreased from that of 1976-1977. (appendix A)

   A. The total student credit-hour production decreased at 11 of the 18 institutions. The largest percentage decrease was 11 percent at Mansfield. The greatest decrease numerically was 62,000 student credit hours at Temple.

   B. The graduate student credit-hour production decreased at 11 of the 18 institutions--Penn State, Cheyney and Mansfield by 25 percent. The largest numerical decrease was 35,000 graduate student credit hours at Penn State.

   C. Twelve of the 18 institutions reported a drop in summer term production. The largest numerical decrease was 16,000 student credit hours at the University of Pittsburgh. Cheyney's summer production was halved, dropping to 3,000 student credit hours.

D. With respect to degree production, from 1976-1977 to 1977-1978 the number of bachelor's degrees awarded decreased at 11 of the 18 institutions. The number of degrees at Penn State fell at the bachelor's, master's and doctor's levels. Pittsburgh awarded more degrees at each of these levels. The master's/first professional level was the only one at which the degrees decreased at Temple.

2. As in the past, class size remains the most important variable in determining salary cost per student credit hour.

   A. Each of the State-related universities report that 73 percent or more of their lower-division undergraduate classes have at most 30 students during the academic year. (Table 4)

   B. A statistical analysis based on individual departments at all 18 institutions indicates a savings of 4 percent--$1.70 per student credit hour--if the average class size were increased by one student. (page 27)

3. At Slippery Rock the average classroom contact hours increased from 11 to 14 hours a week. Among the other institutions the greatest increase was one hour of contact. (Table 5)

4. The full-time faculty members report spending an average of eight and one-half hours a day for six days each week on university-related work during the fall term 1977. (Tables 5 and 6)

5. The average faculty salaries at all State-owned institutions are higher than those at any of the State-related universities. Eight of the 14 State-owned institutions have 70 percent or more of their ranked faculty in the ranks of professor or associate professor. (Table 7)

6. Although the State appropriation for the 18 institutions increased by only 3 percent, because of the reduction in output the overall appropriation per lower-division full-time student equivalent increased by over 6 percent from 1976-1977 to 1977-1978. At four of the institutions--Penn State, Edinboro, Lock Haven and Mansfield--the percentage increases in appropriation per lower-division full-time student equivalent are equal to 10 percent or more. (Table 9)

7. The Commonwealth appropriations per lower-division full-time student equivalent for 1977-1978 range from $2,430 at Mansfield to less than $900 at Penn State. If the 1977-1978 production were maintained, the proposed 1979-1980 Governor's Executive Budget would provide Mansfield with $2,700 and Penn State with $960 for each lower-division full-time student equivalent. (Table 9 and page 33)

8. Salary costs per student credit hour vary widely by department at each institution. Unit costs are consistently low in the departments of psychology and high in the departments of foreign languages. Schools with high unit costs in certain departments could go "back

to the basics" with respect to program offerings, schedule larger classes (if that alternative exists) or share faculty for special or highly expensive programs. (Table 8)

STUDENT CREDIT HOURS AND DEGREES AS MEASURES OF PRODUCTIVITY

Student credit hours and degrees, measures common to institutions of higher learning, enable comparison of the instructional output of various levels and courses of instruction.

Administrative decisions concerning the areas of study an institution can support, the range of courses offered, the assignment of courses to faculty members and the size of classes are affected by the volume of an institution's student credit-hour production.

Table 1 presents for each of the 18 Pennsylvania colleges and universities under review the total 1977-1978 student credit-hour and degree production by level of instruction as well as the number of full-time equivalent students.[1] As can be readily observed, there is a wide range in school size and in the mix of credit hours by level. The student

1. Full-time equivalent is based on 30 undergraduate and 24 graduate student credit hours--the number earned by a full-time student during the academic year.

Table 1

FULL-TIME EQUIVALENT STUDENTS
STUDENT CREDIT-HOUR AND DEGREE PRODUCTION
1977-1978

Institution	Number of full-time equivalent students (000's)	Number of student credit hours (000's)					Number of degrees		
			Undergraduate		Graduate				
		Total	Lower division	Upper division	Master's and 1st Prof.	Doctor's	Bachelor's	Master's and 1st Prof.	Doctor's
State-related universities									
Pennsylvania State	54.4	1,606	931	569	49	57	8,220	1,392	354
Pittsburgh	28.0	790	395	198	168	29	3,606	2,401	389
Temple	27.9	785	324	248	200	13	3,359	2,111	272
Lincoln	1.2	36	26	9	1	n.a.	183	n.a.	n.a.
State-owned colleges									
Bloomsburg	6.3	186	108	67	11	n.a.	1,056	194	n.a.
California	4.4	129	87	33	9	n.a.	822[a]	207[a]	n.a.
Cheyney	2.7	79	57	19	3	n.a.	390	38	n.a.
Clarion	5.2	154	104	43	7	n.a.	881	165	n.a.
East Stroudsburg	4.2	124	78	38	8	n.a.	765	73	n.a.
Edinboro	5.5	161	103	48	10	n.a.	975	278	n.a.
Indiana University	12.1	357	224	113	20	--[b]	2,143	365	4
Kutztown	4.6	135	82	46	7	n.a.	747	174	n.a.
Lock Haven	2.3	70	51	19	n.a.	n.a.	460	n.a.	n.a.
Mansfield	2.6	76	50	23	3	n.a.	531	31	n.a.
Millersville	5.6	163	113	34	16	n.a.	938	240	n.a.
Shippensburg	5.5	160	105	39	16	n.a.	899	416	n.a.
Slippery Rock	5.7	170	116	46	8	n.a.	1,054	152	n.a.
West Chester	8.2	241	146	77	18	n.a.	1,248	343	n.a.

n.a. Not applicable.
a. 1977 degrees.
b. Rounds to less than 1,000 student credit hours.

SOURCE: Student credit-hour production and degree reports provided by the individual institutions, 1978.

credit-hour production of each of the three large State-related universities--Penn State, Pittsburgh and Temple--is more than double that of Indiana and more than four times that of each of the State-owned colleges, except West Chester.

Appendix table A shows student credit-hour production for the past two years. Although the changes in the total production generally are small, it is notable that 11 of the 18 institutions report decreases, several of which are significant in terms of either the percentage decrease or the volume of the student credit-hour reduction.

	Decrease in Total Production 1976-1977 to 1977-1978	
Institution	Percent	Number of student credit hours (000's)
Penn State	.2%	3
Pittsburgh	4.0	30
Temple	7.0	62
California	6.0	8
Edinboro	5.0	9
Kutztown	3.0	4
Lock Haven	7.0	5
Mansfield	11.0	9
Millersville	2.0	3
Shippensburg	2.0	3
Slippery Rock	6.0	11

Lower-Division Undergraduate Production

Because of cost considerations, the institutions with low volumes of student credit-hour production are limited in the number of areas of study that can be offered, since each area requires introductory, lower-division courses. Lincoln University, producing only 26,000 student

credit hours at the lower-division level, would appear to have the greatest challenge in balancing an acceptable offering of courses with affordable unit costs. Lincoln reported offering degrees in 10 basic divisions which are comparable to those offered at many of the private colleges in Pennsylvania. For example, Haverford--a private college slightly smaller than Lincoln--offers degrees in 9 Hegis divisions, 8 of which correspond to those at Lincoln.[2] In addition, Lincoln offers programs in education and business.

The number of Hegis divisions at some of the other smaller State-owned colleges could be reduced if two or more of these institutions located in close proximity shared the responsibility of offering special programs such as home economics, library science and computer science.

Upper-Division Undergraduate Production

As shown in Table 1, at each institution there is a significant decrease in the number of student credit hours produced at the upper-division undergraduate level from those produced at the lower-division. The ratio of upper-division student credit hours produced to the number of bachelor's degrees granted varies from school to school. While the total student credit hours required to earn the number of degrees range from 120 to 128 credit hours, most of the State-owned institutions report an average of less than 50 upper-division credits per bachelor's degree.

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2. Biological sciences, fine and applied arts, foreign languages, letters, mathematics, physical sciences, psychology and social sciences. The Hegis classification system--an acronym for Higher Education General Information Survey--was developed by the Education Division of the U.S. Department of Health, Education and Welfare.

Assuming stable conditions, a low ratio of upper-division student credit hours per degree reflects the enrollment of many upperclassmen in lower-division courses. This is a telling observation since a degree earned largely on the basis of introductory level courses cannot be considered of comparable quality to one resulting from completion of a greater number of upper-level courses.

Graduate Production

As shown on appendix table A, there was a significant decrease in total student credit-hour production at the graduate level from 1976-1977 to 1977-1978, with 11 of the 18 schools showing reductions. The greatest decreases (25 percent) were reported at Penn State, Cheyney and Mansfield. The text table below indicates the extent of decrease at each of the 11 schools.

	Decrease in Graduate Production 1976-1977 to 1977-1978	
Institution	Percent	Number of student credit hours (000's)
Penn State	25%	35
Temple	12	30
Bloomsburg	8	1
California	10	1
Cheyney	25	1
Edinboro	9	1
Kutztown	12	1
Mansfield	25	1
Millersville	11	2
Slippery Rock	11	1
West Chester	14	3

These data raise questions concerning the continued economic feasibility of graduate production at some of the smaller institutions.

Comparison of student credit hours produced at the graduate level with the graduate degrees granted (Table 1) shows that for most of the institutions the total number of graduate student credit hours far exceeds the number required to earn the degrees. Such comparisons substantiate the general impression that much graduate-level work extends over many years and that a large amount does not lead to the awarding of degrees.

At the doctoral level, the ratio of student credit hours to degrees granted at Penn State is more than double that of the University of Pittsburgh. Temple's ratio of student credit hours to doctoral degrees granted is even less than that at the University of Pittsburgh, which may mean that Temple has awarded more graduate degrees for courses completed at other institutions.

Academic Year Production

The distribution of student credit-hour production by the four instructional levels at Pittsburgh and Temple during the academic year indicates a significantly different student-body composition from that of the other institutions. As shown on Table 2, Pittsburgh has 23 percent and Temple 27 percent of production at the graduate level. Penn State, Lincoln and the State-owned institutions produce 6 percent or less of their total student credit hours at the graduate level. The graduate output at Penn State, however, differs from that of the State-owned institutions in that half of it is attributed to the doctoral

Table 2

STUDENT CREDIT-HOUR PRODUCTION
ACADEMIC YEAR AND SUMMER, 1977-1978

Institution	Academic year							Summer						
	Total student credit hours (000's)	Percentage distribution						Total student credit hours (000's)	Percentage distribution					
		Undergraduate			Graduate				Undergraduate				raduate	
		Lower division	Upper division	Total	Master's and 1st Prof.	Doctor's	Total		Lower division	Upper division	Total	Master's and 1st Prof	Doctor's	Total
State-related universities														
Pennsylvania State	1,508	59%	35%	94%	3%	3%	6%	98	45%	34%	79%	7%	14%	21%
Pittsburgh	682	52	25	77	20	3	23	108	40	24	64	29	7	36
Temple	713	42	31	73	25	2	27	72	27	39	66	33	1	34
Lincoln	33	73	23	96	4	n.a.	4	3	69	24	93	7	n.a.	7
State-owned colleges														
Bloomsburg	168	60	37	97	3	n.a.	3	18	41	30	71	29	n.a.	29
California	116	70	25	95	5	n.a.	5	13	44	30	74	26	n.a.	26
Cheyney	76	73	24	97	3	n.a.	3	3	56	29	85	15	n.a.	15
Clarion	142	69	28	97	3	n.a.	3	12	44	35	79	21	n.a.	21
East Stroudsburg	111	65	32	97	3	n.a.	3	13	47	16	63	37	n.a.	37
Edinboro	147	66	30	96	4	n.a.	4	14	40	32	72	28	n.a.	28
Indiana University	320	64	32	96	4	--[a]	4	37	52	27	79	20	1	21
Kutztown	126	62	35	97	3	n.a.	3	9	39	24	63	37	n.a.	37
Lock Haven	66	73	27	100	n.a.	n.a.	n.a.	4	68	32	100	n.a.	n.a.	n.a.
Mansfield	72	67	31	98	2	n.a.	2	4	41	34	75	25	n.a.	25
Millersville	141	72	22	94	6	n.a.	6	22	51	10	61	39	n.a.	39
Shippensburg	146	69	25	94	6	n.a.	6	14	34	23	57	43	n.a.	43
Slippery Rock	158	70	27	97	3	n.a.	3	12	46	30	76	24	n.a.	24
West Chester	217	62	33	95	5	n.a.	5	24	46	24	70	30	n.a.	30

n.a. Not applicable.
a. Rounds to less than 1 percent.

SOURCE: Student credit-hour production reports provided by the individual institutions, 1978.

level. Indiana has less than 1 percent of its total production at the doctoral level, and the State-owned colleges and Lincoln have no output at that level.

Table 2 shows the difference in the academic year between lower-level and upper-level undergraduate student credit-hour production. In general, the percentage of student credit hours at the upper-division level is half or less than that at the lower-division level. The most striking exception to this relationship is Temple's distribution, with 31 percent of its output in the upper division and only 42 percent in the lower division.

Summer Term Production

There is a greater proportion of upper-division and, most particularly, graduate-level work during the summer term at all institutions. For example, only two institutions have more than 60 percent of their student credit-hour output at the lower-division level during the summer term, while during the academic year six institutions have 70 percent or more of total student credit hours taught at the lower-division level. In general, during the summer term the upper-division output is roughly three-fourths of that of the lower-division. Only at Temple, however, does upper-division production exceed that of the lower-division. With the exception of Cheyney (and Lock Haven with no graduate work), the State-owned institutions all have summer graduate-level output exceeding 20 percent of total summer student credit-hour production.

In addition to the percentage distribution of hours produced by level of instruction at the institutions during the academic year and summer, Table 2 shows each institution's total number of student credit hours produced for these two periods. As has been noted in previous reports, the total production during the summer term continues to be a small part of the annual production. Pittsburgh produces the largest portion of total work in the summer--14 percent of its 1977-1978 student credit-hour production. Cheyney produces the smallest proportion of total student credit hours during the summer--4 percent of its 1977-1978 production.

Twelve of the 18 institutions reported decreases in summer student credit-hour production from summer 1977 to summer 1978, as shown on appendix table A. The percentage decreases at Cheyney and Mansfield were 50 percent and 33 percent, respectively.

	Decreases in Summer Production 1977 to 1978	
Institution	Percent	Number of student credit hours (000's)
Pittsburgh	13%	16
Temple	10	8
California	19	3
Cheyney	50	3
Edinboro	12	2
Kutztown	10	1
Lock Haven	20	1
Mansfield	33	2
Millersville	8	2
Shippensburg	7	1
Slippery Rock	14	2
West Chester	4	1

These decreases, considered on a percentage basis, demonstrate a need for reevaluation of the summer program in the State as a whole. The value of the availability of higher education during the summer for certain students is not in question, but the possibility of consolidation of the summer programs among institutions should be given serious consideration.

Degrees

From 1976-1977 to 1977-1978 the number of degrees granted at every level decreased at the majority of the institutions (Appendix table A). While 11 of the institutions granted fewer bachelor's degrees, Pittsburgh, Temple, Lincoln, Bloomsburg, Lock Haven, Shippensburg and West Chester each granted a greater number. At the master's and first professional level the number of degrees granted at all of the institutions decreased, except for the University of Pittsburgh and Clarion, which produced 298 and 15 additional degrees, respectively; of the 4 universities granting doctoral degrees, only Penn State granted fewer degrees.

CLASS SIZE

As demonstrated in previous reports, average class size is the most significant factor affecting salary costs per student credit hour. Consideration of Table 3 leads to the conclusion that there is no recognizable relationship between the average number of students per class at the same level of instruction and the size of the institutions

under review.[3] Although the larger schools should be better able to achieve salary cost savings because of their greater flexibility in scheduling larger classes, their average class sizes are often no different from those of much smaller schools. In fact, for the academic year two of the State-owned schools (East Stroudsburg and Indiana) have larger average lower-division class sizes than Penn State. Even though Edinboro reported more than four times as many lower-division student credits as did Lincoln for the academic year, Edinboro's average class size is smaller.

The lack of any relationship between average class size and institutional size appears to indicate that a variety of courses are scheduled and optimum class sizes established for the various courses and levels of instruction with little attention paid to cost efficiency.

The average class sizes in the summer do reflect the changes in enrollment from the academic year to the summer term at each institution. The marked drop in the average undergraduate class sizes can be explained by the fact that overall the lower-division student credit hours produced in the summer term are generally less than 15 percent of those produced in one semester of the academic year. For graduate courses, where the

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3. The average class sizes shown on Table 3 were calculated by dividing the total credits assigned for all courses at each level into the total student credit hours produced at the respective levels. It should be noted that the differences in average class size at the upper-division and graduate levels between Penn State and Pittsburgh are partially due to different methods of calculating the assigned credits for courses in which students work more or less independently. The resulting class sizes as calculated as the ratio of student credit hours to assigned credits tend to be slight overestimates for Penn State and underestimates for Pittsburgh.

Table 3

AVERAGE CLASS SIZES BY LEVEL[1]
ACADEMIC YEAR AND SUMMER, 1977-1978

Institution	Academic year			Summer		
	Undergraduate			Undergraduate		
	Lower division	Upper division	Graduate	Lower division	Upper division	Graduate
State-related universities						
Pennsylvania State	30	22	8	26	14	7
Pittsburgh[2]	28	12	5	15	8	3
Temple	26	21	20	15	14	13
Lincoln	23	14	10	13	12	17
State-owned colleges						
Bloomsburg	29	18	14	14	9	13
California	23	16	9	12	11	8
Cheyney	24	12	9	11	8	8
Clarion[3]	30	17	9	14	10	7
East Stroudsburg	32	19	14	16	12	18
Edinboro	20	13	7	14	8	9
Indiana University	31	17	7	17	8	8
Kutztown	26	17	13	16	15	17
Lock Haven	25	15	n.a.	15	12	n.a.
Mansfield	23	12	9	10	8	6
Millersville	27	19	18	16	13	18
Shippensburg	28	23	12	13	15	11
Slippery Rock	30	16	10	14	11	10
West Chester	27	20	10	16	13	10

n.a. Not applicable.

1. Average class sizes calculated for each level by division of student credit hours produced by course credit hours assigned.
2. Does not include data for School of Dental Medicine.
3. Data provided for student credit-hour production of full-time faculty only.

SOURCE: Student credit-hour production reports provided by the individual institutions, 1978.

production proportionally increases during the summer from the academic year, the class sizes for the two periods are comparable.

Table 4 shows the distributions of class sizes at the lower-division level during the academic year. At many institutions there are significant percentages of extremely small classes, even though each class, regardless of size, demands a comparable amount of the instructor's classroom time. In each of the State-related universities and six of the State-owned colleges, the percentage of classes having 10 or fewer students is greater than the percentage of classes having 40 or more students. If the faculty members' salaries were distributed according to the time spent in the classroom, the per student cost to the institution of a class size of 5 would be 10 times that of a class size of 50 students.

Further substantiation of the hypothesis that maximum class sizes are unrelated to institutional size is provided in Table 4 by the column showing the percentage of classes having 30 or fewer students at the lower-division level. At the three largest universities, more than 70 percent of the classes fall into this category. At the other institutions, the percentages of classes having 30 or fewer students range from 58 percent at Shippensburg to 84 percent at Edinboro. It should be emphasized that these are lower-division undergraduate classes during the academic year when the school production is at its peak.

Table 4

PERCENTAGE DISTRIBUTION OF CLASSES BY SIZE
UNDERGRADUATE LOWER DIVISION ONLY
ACADEMIC YEAR, 1977-1978

Institution	Cumulative percentage of total classes with:				Percentage of total classes with:	
	1-5 students	1-10 students	1-20 students	1-30 students	31-40 students	More than 40 students
State-related universities						
Pennsylvania State	7%	14%	39%	73%	14%	13%
Pittsburgh	14	25	55	76	10	14
Temple	6	16	49	74	14	12
Lincoln	9	23	51	77	15	8
State-owned colleges						
Bloomsburg	4	9	27	66	22	12
California	6	20	49	76	12	12
Cheyney	8	19	46	68	15	17
Clarion	7	26	53	74	14	12
East Stroudsburg	1	7	36	64	18	18
Edinboro	12	24	55	84	13	3
Indiana University	7	12	30	64	15	21
Kutztown	7	15	34	64	19	17
Lock Haven	2	12	44	74	18	8
Mansfield	8	23	53	81	12	7
Millersville	1	5	29	70	23	7
Shippensburg	1	6	27	58	35	7
Slippery Rock	3	10	28	62	25	13
West Chester	3	9	38	70	17	13

SOURCE: Lower-division undergraduate distributions of classes by size provided by the institutions, 1978.

FACULTY CLASSROOM CONTACT HOURS AND OTHER WORK-RELATED ACTIVITIES

Table 5 shows the average time spent by faculty members in various work-related activities at each institution. Table 6 presents a distribution of the average total number of hours in faculty workweeks. The data on these tables were calculated on the basis of reports made by full-time faculty members for the fall term 1977. Any comparisons made among the schools from data in Tables 5 and 6 must be tempered by consideration of the composition of the faculty included in the reports.[4]

Components of Faculty Workweek

For analytical purposes, the components of the faculty workweek are categorized in Table 5 as average weekly hours of classroom contact, instructional support (class preparation), research and other (public and university) work-related services. To facilitate comparison among the schools, the graduate contact hours reported by faculty have been weighted[5] and added to the undergraduate contact hours. This weighted

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4. Penn State this year treated many of its full-time faculty members who were partially involved in research and activities other than teaching as part-time teaching faculty and excluded them from their full-time faculty reports; the number of full-time faculty who completed full-time faculty work-load reports dropped from 2,692 for fall 1976 to 1,911 for fall 1977. The result for the average Penn State faculty workweek is a slight increase in classroom contact hours and a decrease in the hours reported for research and other services. The submission of workweek reports by full-time faculty members at some of the State-owned institutions, especially Indiana and Cheyney, is incomplete, but the lack of response may be random (in which case the averages would not be affected). For the fall term, about three-quarters of the full-time faculty reported from Indiana while less than 60 percent reported from Cheyney.

5. The graduate contact hours have been multiplied by 1.25 to make a faculty work load of 4 contact hours at the graduate level equivalent to 5 contact hours at the undergraduate level.

Table 5

AVERAGE WEEKLY HOURS SPENT IN SPECIFIED ACTIVITIES AS REPORTED BY FULL-TIME FACULTY
FALL TERM, 1977

Institution	Number of full-time faculty reporting	Contact hours: Undergraduate	Contact hours: Graduate	Contact hours: Total undergraduate equivalent[1]	Instructional support	Support per undergraduate equivalent	Research	Other service	Average workweek
State-related universities									
Pennsylvania State	1,911	10	2	12	25	2.1	10	6	53
Pittsburgh	1,612	5	5	11	18	1.6	15	12	55
Temple	1,339	6	4	11	17	1.6	12	14	53
Lincoln	66	11	0	11	22	2.0	4	22	59
State-owned colleges									
Bloomsburg	291	12	1	13	17	1.3	7	16	53
California	308	9	1	10	16	1.6	7	18	51
Cheyney	104	11	1	12	17	1.4	7	17	53
Clarion	294	10	1	11	16	1.4	7	17	51
East Stroudsburg	222	11	1	12	19	1.6	7	19	57
Edinboro	383	12	1	13	18	1.4	9	15	55
Indiana University	422	12	1	13	18	1.4	9	16	56
Kutztown	293	11	1	12	16	1.3	9	16	53
Lock Haven	165	12	n.a.	12	15	1.3	7	18	52
Mansfield	190	10	1	11	23	2.1	6	12	52
Millersville	296	11	1	12	16	1.3	8	17	53
Shippensburg	287	9	1	10	18	1.8	9	16	53
Slippery Rock	321	13	1	14	17	1.2	7	15	53
West Chester	431	12	1	13	15	1.1	9	15	52

n.a. Not applicable.
1. Undergraduate equivalent contact hours equal undergraduate contact hours plus 1.25 times graduate contact hours.

SOURCE: Reports of average weekly hours of work-related activities provided by full-time faculty members of the institutions, 1978.

sum divided by the number of faculty who reported is the total undergraduate equivalent, as shown on the table.

While an examination of faculty hours spent in classroom contact is important in an output study, the other faculty work-related activities, such as classroom preparation and research, influence the quality of instruction and represent a sizeable portion of the average workweek. For the 18 institutions, the median of the average weekly undergraduate equivalent hours of classroom contact reported is 12 hours; all but 3 of the averages fall within 11 to 13 hours. The average hours for instructional support range from 15 to 25, with a median of 17 hours. The overall average workweeks at the 18 institutions have a small variation--only 3 differ from the median of 53 hours by more than 2 hours.

The average number of undergraduate equivalent classroom contact hours changed very little from fall 1976 to fall 1977. Except for Slippery Rock, the average contact hours differ at most by one hour. For Slippery Rock, however, the reported contact hours increased from an average of 11 in fall 1976 to 14 in fall 1977.

As Table 5 indicates, the average number of hours spent on instructional support is not determined solely on the basis of classroom contact hours. For example, while the faculty members at Penn State report the largest average number of hours spent in instructional support (25), their average number of equivalent contact hours is 12--the median for all institutions.

The relationship of these two factors can be observed in the column presenting hours of instructional support for each undergraduate equivalent classroom contact hour. This ratio ranges from 1.1 at West Chester to 2.1 at Penn State and Mansfield.

The largest average number of hours in research is reported by the faculty at Pittsburgh (15). The median of average hours spent on research at the State-owned colleges is 7. Such a difference is to be expected, since none of the State-owned colleges except Indiana have courses at the doctoral level.

Total Workweek

While the average faculty workweek varies little among institutions, the 8,935 individual full-time faculty members providing data for fall 1977 report workweeks ranging from less than 30 hours (for about 1 percent of these faculty) to 80 or more hours (for about 2 percent), as Table 6 indicates. Approximately 40 percent of all faculty members, however, report working between 50-59 hours per week. Cheyney and West Chester are the only institutions with more than half of the faculty spending 50 hours or less per week in work-related activities. At each of the remaining institutions, the median workweek is equivalent to 8.5 or more hours per day for 6 days each week. The percentage of faculty members reporting less than 60 hours per week ranges from 64 percent at Lincoln and Indiana University to 85 percent at California.

These observations are calculated on the basis of reports for the fall term, which is generally the busiest term. Many of the faculty

Table 6

AVERAGE WEEKLY HOURS OF WORK-RELATED ACTIVITIES AS REPORTED BY FULL-TIME FACULTY
FALL TERM, 1977

Institution	Cumulative percentage of full-time faculty with weekly work average of: 1-29 hours	1-39 hours	1-49 hours	1-59 hours	1-69 hours	1-79 hours	Median hours per week reported by full-time faculty members
State-related universities							
Pennsylvania State	--[a]%	2%	36%	77%	95%	99%	53
Pittsburgh	--[a]	3	29	70	92	98	55
Temple	2	7	38	77	95	99	53
Lincoln	8	15	36	64	76	85	54
State-owned colleges							
Bloomsburg	0	6	35	75	93	98	53
California	0	9	45	85	97	99	51
Cheyney	5	20	53	72	85	91	49
Clarion	0	11	47	84	94	99	51
East Stroudsburg	--[a]	4	28	66	87	93	55
Edinboro	1	9	37	66	87	95	54
Indiana University	1	5	28	64	85	95	56
Kutztown	0	8	38	80	93	98	52
Lock Haven	1	12	40	84	92	98	52
Mansfield	8	22	45	70	87	94	51
Millersville	0	2	32	83	96	99	53
Shippensburg	0	2	33	77	93	98	53
Slippery Rock	0	7	36	80	94	98	53
West Chester	1	15	54	77	89	96	48

a. Rounds to less than 1 percent.

SOURCE: Reports of average weekly hours of work-related activities as provided by full-time faculty members of the institutions, 1978.

[illegible] during the summer, and those who are carry lighter schedules, as can be deduced from previous comparisons of production in the academic year and the summer terms. The heavier work load for a nine-month period permits an annual faculty salary comparison with persons in other professions working 35 to 40 hours a week on a twelve-month basis, as shown in appendix B.

FACULTY SALARIES

A review of salaries highlights basic differences among the schools in the ranking and compensating of faculty.

The administrative policies pertaining to salary contracts and use of part-time faculty differ widely from one institution to another. The salary contracts at Penn State, for example, differ within the institution. Some contracts cover the twelve-month period, even though the teaching schedule of the faculty member includes only three of the four terms. At Temple, faculty members are employed on a salary basis for the academic year and are paid for the summer term on the basis of the work assigned. Many departments in the various institutions employ low-ranking faculty to handle excess work loads at lower average salaries. Other departments in the same institution employ as part-time teaching faculty those full-time faculty members who are also involved in administration or research projects on a part-time basis.

For purposes of comparison in this report, average salaries for the academic year are calculated in a manner to take into account the

different contracts and use of part-time faculty.[6] Table 7 presents overall average salaries and average salaries by rank for full-time equivalent faculty members, together with the percentage distribution of the four ranks.

Since the average salaries for faculty in the two top ranks--professor and associate professor--are significantly higher than those for the two lower ranks, the overall average salaries of schools with large percentages of faculty members in these high ranks are correspondingly high. It is paradoxical that the State-owned colleges--most of which have high proportions of their total instructional output at the lower-division level--have higher average faculty salaries than the State-related universities as well as prestigious private institutions (appendix D). Accounting for this is the fact that 8 of the 14 State-owned institutions have 70 percent or more of ranked faculty in the rank of professor or associate professor.

Although Penn State pays next to the highest average salary for the rank of professor, the percent in the professorial rank is only 20 percent. As a result the overall average salary is $18,200, the same as for Lincoln. The only overall average salary lower than this is $17,900 at Pittsburgh. The highest average salary for the State-related universities

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6. The total faculty salary for each institution for the entire year--academic year and summer--was divided by the sum of the full-time equivalent faculty members for each term. This ratio, treated as the average salary of a faculty member for one term, was multiplied by the number of terms in the academic year. The full-time equivalent faculty were determined on the basis of the percentage distributions of part-time faculty reported by each institution, except Penn State in which case the full-time equivalent numbers of faculty were applied as reported.

Table 7

AVERAGE SALARY FOR FULL-TIME EQUIVALENT TEACHING FACULTY
ACADEMIC YEAR, 1977-1978

Institution	Average salary--all ranks (000's)	Professor		Associate Professor		Assistant Professor		Instructor	
		Average salary (000's)	Percent of faculty	Average salary (000's)	Percent of faculty	Average salary (000's)	Percent of faculty	Average salary (000's)	Percent of faculty
State-related universities									
Pennsylvania State	$18.2	$26.2	20%	$20.1	26%	$15.7	37%	$11.7	17%
Pittsburgh[1]	17.9	24.0	25	19.4	33	14.3	29	10.4	13
Temple	18.5	27.2	24	20.0	30	15.0	29	9.7	17
Lincoln	18.2	22.6	27	19.1	16	16.0	41	15.7	16
State-owned colleges									
Bloomsburg	19.3	23.8	30	19.6	38	15.1	27	11.4	5
California	21.2	24.4	40	19.9	45	16.5	14	13.6	1
Cheyney	18.6	22.1	29	18.5	46	15.4	15	13.0	10
Clarion[2]	20.4	25.4	26	21.0	40	16.9	24	13.4	10
East Stroudsburg	19.2	24.5	33	20.0	31	15.6	24	9.7	12
Edinboro	20.0	23.5	37	19.6	35	16.2	26	10.4	2
Indiana University	20.5	24.5	38	20.1	35	15.9	21	12.3	6
Kutztown	20.2	24.3	30	20.4	41	16.5	20	12.8	9
Lock Haven	20.5	25.1	27	20.1	47	16.9	23	12.6	3
Mansfield	20.0	25.6	23	20.3	45	16.0	24	12.5	8
Millersville	19.9	24.4	30	20.2	40	15.9	24	12.5	6
Shippensburg	20.3	24.7	31	20.1	39	16.6	26	12.5	4
Slippery Rock	20.0	24.4	33	19.6	35	16.6	21	14.0	11
West Chester	19.8	24.5	29	20.2	40	15.8	24	12.5	7

1. Excluding School of Dental Medicine.
2. Data provided for full-time faculty only.

SOURCE: Salary reports provided by the individual institutions, 1978.

is $18,500 at Temple, which is still lower than the average at any of the State-owned institutions. The highest average salary for all institutions is $21,200 at California, where 40 percent of the ranked faculty are professors.

The average salary for professors for the academic year indicates a wide range among the institutions--from $27,200 at Temple to $22,100 at Cheyney. The salary range for the rank of instructor exhibits a similar range--from $15,700 at Lincoln to $9,700 at Temple and East Stroudsburg.

SALARY COST PER STUDENT CREDIT HOUR

Among all variables, class size is the most significant in explaining the differences in the faculty salary cost per student credit hour for the various levels and programs of instruction. A large proportion of small classes escalates an institution's or a department's unit salary costs. A regression equation based on 173 departmental observations at the 18 institutions indicates a savings of 4 percent--$1.70 per student credit hour--if the average class size were increased by one student.

The large universities have far more potential flexibility than the small schools in achieving low salary costs per student credit hour. In practice, however, the large schools tend to negate the economies of scale afforded by large enrollments by expanding their program and course selections and limiting class sizes.

In general, unit salary costs are higher for the higher levels of instruction. Following are the average salary costs per student credit hour for 1977-1978 for all 18 schools.[7]

Undergraduate	
Lower division	$28
Upper division	45
Graduate	
Master's	88
Doctor's	188

It should be noted initially that because Penn State changed its reporting of full- and part-time faculty for 1977-1978, its unit costs shown in this report are in most instances lower than those for previous years. Had Penn State used the same methodology as it did for 1976-1977 data, the unit costs per lower-division equivalent student credit hour shown on Table 8 may have been on the average as much as $5 higher.[8]

Table 8 shows each school's salary cost per lower-division undergraduate equivalent student credit hour (see appendix C) for eight basic departments.

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7. See appendix C for the method of calculating unit costs by level and determining lower-division equivalent student credit hours.

8. The total salary reported by Penn State for 1977-1978 was approximately $8 million less than that reported for 1976-1977. For 1977-1978 Penn State reported as full-time those faculty who were engaged only in instruction and related activities. Those full-time faculty who spent portions of their work-load assignments in research or public service were included as part-time faculty and only a portion of their salaries was reported. This change in methodology amounts to a reduction of approximately 800 full-time faculty for fall 1977 from the total in fall 1976 and deletion of roughly half of their salaries. If it is assumed that the salaries increased by 7 percent since last year, the reduction could actually be as much as $12 million.

Table 8

SALARY COST PER LOWER-DIVISION UNDERGRADUATE
EQUIVALENT STUDENT CREDIT HOUR[1] BY DEPARTMENT
1977-1978

Institution	Departments							
	Sciences	Foreign Languages	Mathematics	Political Science	English	History	Psychology	Education
State-related universities								
Pennsylvania State	$20	$26	$22	$23	$23	$26	$17	$20
Pittsburgh	54	44	30	34	30	35	24	26
Temple	29	35	30	18	36	27	24	20
Lincoln	47	49	32	30	34	50	29	36
State-owned colleges								
Bloomsburg	39	48	28	35	30	28	22	19
California	56	93	37	n.a.	61	68	30	34
Cheyney	46	36	33	n.a.	36	n.a.	20	34
Clarion[2]	39	47	35	n.a.	35	39	21	34
East Stroudsburg	34	63	34	24	30	27	26	21
Edinboro	50	61	40	29	42	33	26	37
Indiana University	35	50	28	34	32	38	23	26
Kutztown	35	71	36	34	43	38	24	34
Lock Haven	67	74	39	n.a.	45	42	27	34
Mansfield	47	67	40	30	50	50	35	34
Millersville	37	43	29	35	39	36	19	26
Shippensburg	46	63	33	23	39	31	22	2[illegible]
Slippery Rock	46	52	31	28	37	35	27	3
West Chester	33	39	33	20	44	34	19	2
All institutions	34	40	29	26	33	33	22	2[illegible]

n.a. Not applicable.

1. Student credit-hour weights applied: Undergraduate--lower division, 1; upper division, 2. Graduate--mast[illegible]s, 3; 1st professional, 1; doctor's, 7.

2. Full-time faculty only.

SOURCE: Student credit-hour production and salary reports provided by the individual institutions, 1978.

Because the schools produce differing proportions of credit hours in these departments at the various levels of instruction, each school's credit hours have been weighted to produce a unit salary cost that can be compared with those of other schools.

The total salary costs per lower-division undergraduate equivalent student credit hour for all 8 departments are shown in the last row of Table 8. These unit costs range from $22 in psychology to $40 in foreign languages. While department unit costs show little relationship to the sizes of the schools, some of the largest unit salary costs are at the smaller State-owned schools. For example, Lincoln, California, Lock Haven, Mansfield and Slippery Rock each have salary costs per unit above the overall averages in each of the 8 departments as shown on Table 8. California's unit salary cost for each department shown on the table is at least $8 more than the average for all institutions; the cost of $93 per unit in foreign languages is $53 more than the overall average for foreign languages and the per unit cost of $68 in history is $35 more than the average in history.

The variances in unit costs among the departments may be explained to some extent by the fact some departments--such as foreign languages--have the possibility for a large number of subdivisions, each with a different base curriculum. In such departments a tendency to diversify results in a larger number of smaller classes than in departments such as mathematics and psychology, where subdivision possibilities are more limited.

Schools with high unit costs in certain departments should consider going "back to the basics" with respect to program offerings, to scheduling larger classes (if that alternative exists) or to sharing faculty for special or highly expensive programs.

COMMONWEALTH APPROPRIATIONS

How justifiable is the allocation of Commonwealth funds among the various institutions? With declining credit-hour productions, should the overall appropriations continue to increase? To provide data with which to analyze these issues, the Commonwealth appropriation to each institution is related to the number of "units produced."

The "unit produced" is a composite measure incorporating degree and student credit-hour production, both of which have been weighted to equalize the differences in effort involved in output at the various levels of instruction.[9] Table 9 shows the appropriation per unit produced and per lower-division full-time student equivalent for 1976-1977 and 1977-1978.

While the appropriations per unit produced are significantly different for the various institutions, they are rational only in that they are

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9. It has been assumed that generally a bachelor's degree demands of a faculty member an additional effort equivalent on the average to the production of 10 lower-division undergraduate student credit hours; a master's degree, the equivalent of 20 lower-division student credit hours; and a doctoral degree, the equivalent of 60 lower-division student credit hours. The number of "units produced" at each institution is the sum of such degree equivalents and the number of lower-division student credit hour equivalents. See appendix C, p. 37.

Table 9

COMPARISON OF COMMONWEALTH APPROPRIATIONS, TOTAL PRODUCTION
AND APPROPRIATION PER STUDENT
1976-1977 and 1977-1978

Institution	Units produced[1] 1976-1977 (000's)[2]	Units produced[1] 1977-1978 (000's)	Commonwealth appropriation for instruction 1976-1977 (000's)	Commonwealth appropriation for instruction 1977-1978 (000's)	Appropriation per unit produced 1976-1977	Appropriation per unit produced 1977-1978	Appropriation per lower-division full-time student equivalent[3] 1976-1977	Appropriation per lower-division full-time student equivalent[3] 1977-1978	Percentage increase
State-related universities									
Pennsylvania State	2,889	2,748	$74,457	$79,522	$26	$29	$770	$870	13%
Pittsburgh	1,584	1,567	52,858	52,858	33	34	1,000	1,010	1
Temple	1,653	1,525	56,987	56,987	34	37	1,030	1,120	9
Lincoln	44	49	2,525	3,025	58	61	1,740	1,840	6
State-owned colleges									
Bloomsburg	282	288	11,557	11,926	41	41	1,230	1,240	1
California	208	193	13,019	13,212	63	68	1,880	2,050	9
Cheyney	107	109	7,815	7,986	73	73	2,190	2,200	--[a]
Clarion	217	222	11,974	12,190	55	55	1,650	1,650	0
East Stroudsburg	162[b]	187	8,882	9,187	55[b]	49	1,640[b]	1,480	-10[b]
Edinboro	261	244	13,970	14,300	54	59	1,600	1,760	10
Indiana University	514	541	20,321	21,004	40	39	1,190	1,160	-3
Kutztown	215	206	11,029	11,241	51	55	1,540	1,640	6
Lock Haven	99	93	6,791	7,000	69	75	2,060	2,260	10
Mansfield	124	111	8,985	9,000	72	81	2,170	2,430	12
Millersville	252	245	12,487	12,780	50	52	1,490	1,570	5
Shippensburg	253	248	11,663	11,969	46	48	1,380	1,450	5
Slippery Rock	261	246	13,366	13,344	51	54	1,530	1,630	7
West Chester	368	374	17,134	17,558	47	47	1,400	1,410	1

1. Student credit-hour weights: Undergraduate--lower division, 1; upper division, 2. Graduate--master's, 3; 1st professional, 1; doctor's, 7. Degree weights: bachelor's, 10; master's, 20; 1st professional, 20; doctor's, 60.
2. Number of student credit hours for each level were estimated based on distributions by level for 1977-1978.
3. Thirty times unrounded appropriation per unit produced.
a. Rounds to less than 1 percent.
b. Estimated.

SOURCE: Student credit-hour production and degree reports provided by the individual institutions, 1977 and 1978; 1978-1979 and 1979-1980 Commonwealth of Pennsylvania, Governor's Executive Budgets.

highly correlated to institutional size--the smaller the size of the institution, the greater the appropriation per unit produced.[10] This relationship is to be expected because there is a basic overhead cost to be covered for each institution which is independent of production. The Commonwealth, therefore, is consciously paying a large premium for maintaining a system of small, independently administered schools.

The Commonwealth's appropriations, however, are neither rational nor equitable when considering the change in appropriation from year to year. The appropriation to Penn State increased 7 percent from 1976-1977 to 1977-1978 while the production decreased 5 percent. The production at Pittsburgh decreased only 1 percent and the appropriation was not increased. As a result of determining appropriations independently of the changing production, the changes in the appropriation per full-time lower-division student equivalent (30 times one unit of production) from 1976-1977 to 1977-1978, as shown on Table 9, range from decreases at East Stroudsburg and Indiana to a 13 percent increase at Penn State.

The 1977-1978 appropriations per lower-division full-time student equivalent range from $870 at Penn State to $2,430 at Mansfield. The next highest payment per full-time student ($2,260) was received by Lock Haven. If the 1977-1978 production were maintained the proposed 1979-1980 Governor's Executive Budget would provide Mansfield with $2,700 and Penn State with $960 for each lower-division full-time student equivalent.

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10. Two linear regression equations based on the Commonwealth appropriations to the institutions and the number of units produced at the institutions for 1977-1978 were calculated--one on the 18 institutions and the other on the 14 State-owned colleges and university. In each equation, A equals the Commonwealth appropriation and u, the number of units produced. The regression equation for the 18 institutions is: $A = \$5,536,261 + \$28.86u$ ($R^2 = .9832$). The regression equation for the 14 State-owned institutions is: $A = \$5,156,026 + \$30.39u$ ($R^2 = .8965$).

APPENDIX A

COMPARISON OF STUDENT CREDIT HOURS AND DEGREES
1976-1977 and 1977-1978

Institution	Student credit hours						Degrees					
	Total (000's)		Graduate (000's)		Summer (000's)		Bachelor's		Master's and 1st professional		Doctor's	
	1976-1977	1977-1978	1976-1977	1977-1978	1977	1978	1976-1977	1977-1978	1976-1977	1977-1978	1976-1977	1977-1978
State-related universities												
Pennsylvania State	1,609	1,606	141	106	98	98	8,353	8,220	1,486	1,392	374	354
Pittsburgh	820	790	190	197	124	108	3,484	3,606	2,103	2,401	364	389
Temple	847	785	243	213	80	72	3,264	3,359	2,160	2,111	227	272
Lincoln	33	36	--[a]	1	3	3	155	183	n.a.	n.a.	n.a.	n.a.
State-owned colleges												
Bloomsburg	180	186	12	11	18	18	976	1,056	201	194	n.a.	n.a.
California	137	129	10	9	16	13	934[b]	822[c]	247[b]	207[c]	n.a.	n.a.
Cheyney	76	79	4	3	6	3	395	390	56	38	n.a.	n.a.
Clarion	150	154	7	7	8	12	890	881	150	165	n.a.	n.a.
East Stroudsburg	--[d]	124	--[d]	8	--[d]	13	767	765	116	73	n.a.	n.a.
Edinboro	170	161	11	10	16	14	1,053	975	310	278	n.a.	n.a.
Indiana University	334	357	19	20	32	37	2,149	2,143	594	365	1	4
Kutztown	139	135	8	7	10	9	842	747	203	174	n.a.	n.a.
Lock Haven	75	70	n.a.	n.a.	5	4	419	460	n.a.	n.a.	n.a.	n.a.
Mansfield	85	76	4	3	6	4	572	531	35	31	n.a.	n.a.
Millersville	166	163	18	16	24	22	1,004	938	244	240	n.a.	n.a.
Shippensburg	163	160	16	16	15	14	856	899	504	416	n.a.	n.a.
Slippery Rock	181	170	9	8	14	12	1,059	1,054	155	152	n.a.	n.a.
West Chester	234	241	21	18	25	24	895	1,248	369	343	n.a.	n.a.

n.a. Not applicable.
a. Rounds to less than 1,000 student credit hours.
b. 1975-1976 degrees.
c. 1976-1977 degrees.
d. Inconsistent data.

SOURCE: Student credit-hour production and degree reports provided by the individual institutions, 1977 and 1978.

APPENDIX B

SALARIES OF SELECTED WHITE-COLLAR OCCUPATIONS*

Table 1. Employment and average salaries for selected professional, administrative, technical, and clerical occupations in private industry, United States except Alaska and Hawaii, March 1978

Occupation and level	Number of employees[1]	Annual salaries[2]			
		Mean	Median	Middle range[3]	
				First quartile[4]	Third quartile[5]
Accounts and auditors					
Accountants I	8,658	$12,785	$12,605	$11,450	$13,600
Accountants II	17,156	15,671	15,131	13,718	17,460
Accounts III	31,969	18,115	17,796	15,960	19,992
Accountants iv	20,287	22,036	21,742	19,792	24,000
Accountants v	7,351	27,301	27,189	24,495	29,768
Auditors I	1,589	13,243	12,774	11,471	14,494
Auditors II	2,837	15,694	15,000	13,348	17,493
Auditors III	4,927	18,756	18,493	16,581	20,532
Auditors IV	3,184	23,093	22,500	20,756	25,056
Chief accountants I	836	23,561	22,800	21,991	24,996
Chief accountants II	1,083	27,769	27,489	25,279	30,400
Chief accountants III	562	34,160	33,500	30,480	36,696
Chief accountants IV	256	39,895	38,984	35,400	43,782
Attorneys					
Attorneys I	1,498	17,693	17,493	14,954	19,980
Attorneys II	2,548	21,713	21,325	18,992	23,890
Attorneys III	2,883	27,738	27,489	24,043	20,888
Attorneys IV	2,724	33,547	32,887	29,520	36,985
Attorneys V	1,862	42,318	41,687	37,485	46,481
Attorneys VI	642	51,798	51,000	47,172	56,477
Buyers					
Buyers I	5,345	12,887	12,355	10,800	14,339
Buyers II	14,472	16,195	15,894	14,328	17,880
Buyers III	15,289	19,590	19,292	17,415	21,491
Buyers IV	4,544	23,853	23,220	20,988	26,400
Personal Management					
Job analysts II	339	14,040	13,308	12,195	15,000
Job analysts III	576	18,354	17,964	16,268	20,424
Job analysts IV	521	22,616	22,491	20,492	24,804
Directors of personnel I	937	20,833	20,196	18,480	23,691
Directors of personnel II	1,879	26,245	24,950	22,991	28,677
Directors of personnel III	895	32,201	31,088	27,540	35,432
Directors of personnel IV	286	40,835	39,626	36,665	44,496
Chemists and Engineer					
Chemists I	2,355	13,492	13,615	11,585	15,222
Chemists II	4,135	16,337	16,094	14,220	18,024
Chemists III	8,638	19,453	19,243	17,493	21,350
Chemists IV	9,887	23,532	23,304	21,391	25,590
Chemists V	7,583	28,494	28,289	25,590	30,960
Chemists VI	3,539	33,110	32,580	30,050	35,986
Chemists VII	1,223	38,927	27,185	35,000	42,000
Chemists VIII	400	47,156	46,313	40,984	51,492
Engineers I	16,633	15,928	15,794	14,700	17,097
Engineers II	32,043	17,567	17,400	16,170	18,960
Engineers III	81,495	20,194	19,982	18,183	22,023
Engineers IV	113,509	23,972	23,790	21,600	25,220
Engineers V	81,520	28,001	27,780	25,452	30,420
Engineers VI	39,254	32,264	31,887	29,198	34,934
Engineers VII	13,672	36,520	36,056	33,288	39,492
Engineers VIII	3,685	42,104	41,400	38,062	45,101
Technical Support					
Engineering technicians I	4,74	10,461	10,011	9,177	11,304
Engineering technicians II	14,084	11,918	11,575	10,428	13,035
Engineering technicians III	24,915	14,062	13,974	12,242	15,612
Engineering technicians IV	25,217	16,302	16,200	14,724	17,760
Engineering technicians V	18,088	16,703	16,593	16,946	20,292
Drafter-tracers	6,269	9,803	9,385	7,958	11,601
Drafters I	17,570	11,247	10,840	9,956	12,443
Drafters II	27,038	13,709	13,327	11,836	15,361
Drafters III	27,591	16,982	16,476	14,523	18,666
Computer operators I	5,328	8,546	8,232	7,508	9,333
Computer operators II	7,111	10,352	10,016	8,697	12,213
Computer operators III	24,725	11,274	10,949	9,696	12,514
Computer operators IV	15,413	13,737	13,390	11,836	15,300
Computer operators V	3,666	15,691	15,564	13,704	17,467
Computer operators VI	1,113	18,713	18,271	16,385	19,595
Clerical					
Clerks, accounting I	90,511	8,682	8,220	7,091	9,707
Clerks, accounting II	74,055	10,986	10,500	8,986	12,952
Clerks, file I	30,384	6,621	6,403	5,834	7,032
Clerks, file II	13,421	7,914	7,428	6,570	8,655
Clerks, file III	4,191	10,095	9,489	8,097	11,836
Key entry operators I	64,112	8,546	7,994	7,020	9,411
Key entry operators II	42,435	10,099	9,720	8,509	11,241
Messengers	20,435	7,595	7,143	6,257	8,342
Secretaries I	39,895	9,801	9,489	8,395	10,816
Secretaries II	74,557	10,721	10,428	9,072	11,992
Secretaries III	84,253	11,894	11,604	10,063	13,480
Secretaries IV	53,749	13,018	12,792	11,002	14,700
Secretaries V	17,863	14,430	14,138	12,295	16,383
Stenographers, general	26,031	9,834	9,385	7,915	11,408
Stenographers, senior	27,681	11,018	10,800	9,144	12,549
Typists I	41,215	7,778	7,300	6,600	8,478
Typists II	24,932	9,276	8,820	7,716	10,324

[1]Occupational employment estimates relate to the total in all establishments within the scope of the survey and act to the number actually surveyed.

[2]Salaries reported are standard salaries paid for standard work schedules; I E , the straight-time salary corresponding to the employee's normal work schedule excluding overtime hours. Nonproduction bonuses are excluded, but cost-of-living payments and incentive earnings are included.

[3]The middle range (interquartile) is the central part of the array excluding the upper and lower fourths of the employee distribution—the third quartile minus the first.

[4]The first-quartile salary is the highest salary paid the first 25 percent of the workers in the distribution at each level.

[5]The third-quartile salary is the highest salary paid the third quarter of the workers in the distribution at each level.

*Table reproduced from U.S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review (November 1978): 38.

APPENDIX C

The unit measures in this [illegible] calculated to reflect that student credit-hour production is occurring at the undergraduate and graduate levels in varying proportions at the 18 institutions. In order to account for this production at different levels, weights have been determined to equalize the student credit hours produced at upper levels to lower-division student credit hours. Faculty teaching salaries which represent a significant portion of the total instructional cost were used to establish the weights in the following manner. The teaching salaries for each rank at each institution were distributed among the levels of instruction on the basis of the distribution of assigned credits at each level. In other words, the portion of a faculty member's assigned credits at a given level was used as a measure of the portion of teaching faculty effort at that level.

The sum of the salary dollars distributed in this manner for each of the institutions at each of the instructional levels divided by the student credit hours produced at each level equals the salary costs per student credit hour for 1977-1978 as shown below. The ratio of the costs at the upper levels to the lower-division level cost are the weights which are used in this report to calculate lower-division student credit-hour equivalents.

Level of instruction	Overall salary cost per student credit hour	Ratio to lower-division cost
Undergraduate		
Lower division	$28	1
Upper division	45	2
Graduate		
Master's	88	3
1st professional	20	1
Doctor's	188	7

This method of accounting for the different compositions of the student bodies with the widely ranging costs at different levels provides comparable measurements of production only to the extent that the original data furnished by the different institutions are comparable. For example, the data indicate that the upper-division credit hours as reported by Penn State may include some credits which would have been assigned to lower-division work at the University of Pittsburgh. This inconsistency would at most change the cost per lower-division student credit hour by a dollar.

Penn State and Pittsburgh also differ in their methods of reporting assigned credits at the upper levels. While this difference affected the distribution of their faculty salaries, in the overall average the underestimates at Penn State were at least partially balanced by the overestimates at Pittsburgh.

It is anticipated that in the future the institutions will provide more uniform data. In spite of the differences in methodology, specifically in the case of Penn State and Pittsburgh, a general comparability exists and relevant observations can be made.

APPENDIX D

RANKING OF FACULTY SALARIES OF U.S. COLLEGES AND UNIVERSITIES

The ranking of faculty salaries for Pennsylvania's State-related and State-owned colleges and universities with salaries of other recognized institutions throughout the United States is shown in the Hawes Comprehensive Guide to Colleges by Gene R. Hawes.[1] This publication ranks 1976-1977 median faculty salaries for all regionally accredited colleges in the United States that offer a full, four-year college education.

The salary information is based on research by the National Center for Educational Statistics of the U.S. Department of Health, Education and Welfare and the American Association of University Professors.

Hawes cautions his readers to keep in mind the cost-of-living differences for the various parts of the country when making salary comparisons. Particularly high are the living costs in the large Northeastern metropolitan areas--Boston and New York.

The publication categorizes the median salaries as

Top--$23,000 and up
High--$20,200-$22,999
High average--$18,100-$20,199
Low average--$16,400-$18,099
Low--$14,600-$16,399
Very low--$14,599 and lower

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1. (New York: New American Library, 1978), pp. xxi-xxvi.

The faculty for 13 of the 14 State-owned institutions have median salaries falling in the "high" category. The median salaries for faculty at the 3 large State-related universities fall in the "high average" category. The Hawes publication does not include data for Cheyney and the information for Lincoln is inaccurate.

Following are the Pennsylvania State-owned and State-related institutions and other selected institutions as they are listed in the various salary categories.[2]

Top Faculty Salaries

Medians $23,000 and up--13 colleges, including:

Harvard University, Mass.	$27,200	
University of Chicago	24,200	(mean)
Columbia University, N.Y.	23,500	
Stanford University, Calif.	23,500	

High Faculty Salaries

A. Medians $21,000-$22,999--31 colleges, including:

Johns Hopkins University, Md.	$22,800
University of Pennsylvania	22,300
California State College, Pa.	21,800
Bloomsburg State College	21,700
Clarion State College	21,700
Indiana University of Pa.	21,700
Millersville State College	21,700
Edinboro State College	21,600
Kutztown State College	21,600
Lock Haven State College	21,600
Mansfield State College	21,600
Shippensburg State College	21,600
West Chester State College	21,600
Slippery Rock State College	21,500
George Washington University, D.C.	21,000

2. The faculty for the Pennsylvania institutions whose salaries are evaluated in the staff analysis are ranked faculty only. The Hawes data may include all professional faculty.

B. Medians $20,200-$20,999--25 colleges, including:

Brandeis University, Mass.	$20,900
[illegible]	20,900
California State University-Long Beach	20,900
New York University	20,900
California State University-Los Angeles	20,800
Cornell University, N.Y.	20,800
East Stroudsburg State College, Pa.	20,600
Michigan State University	20,600
University of Wisconsin at Madison	20,500
State University of New York at Buffalo	20,200

High Average Faculty Salaries

A. Medians $19,600-$20,199--19 colleges, including:

Yale University, Conn.	$20,000
Amherst College, Mass.	19,800
Princeton University, N.J.	19,800
California State College-Bakersfield	19,600
Temple University, Pa.	19,600

B. Medians $19,000-$19,599--25 colleges, including:

Pennsylvania State University	$19,500
Purdue University, Ind.	19,500
Washington & Lee University, Va.	19,400
Lehigh University, Pa.	19,200
Drexel University, Pa.	19,100
University of Pittsburgh	19,100

C. Medians $18,100-$18,999--65 colleges

Low Average Faculty Salaries

Medians $16,400-$18,099--225 colleges, including:

Boston State College	$17,900
California State College-Dominguez Hills	17,900
Florida State University	17,900
State University of New York College at Buffalo	17,900
Trenton State College, N.J.	17,900
Haverford College, Pa.	17,800
Colgate University, N.Y.	17,700
State University of New York College at Oneonta	17,700