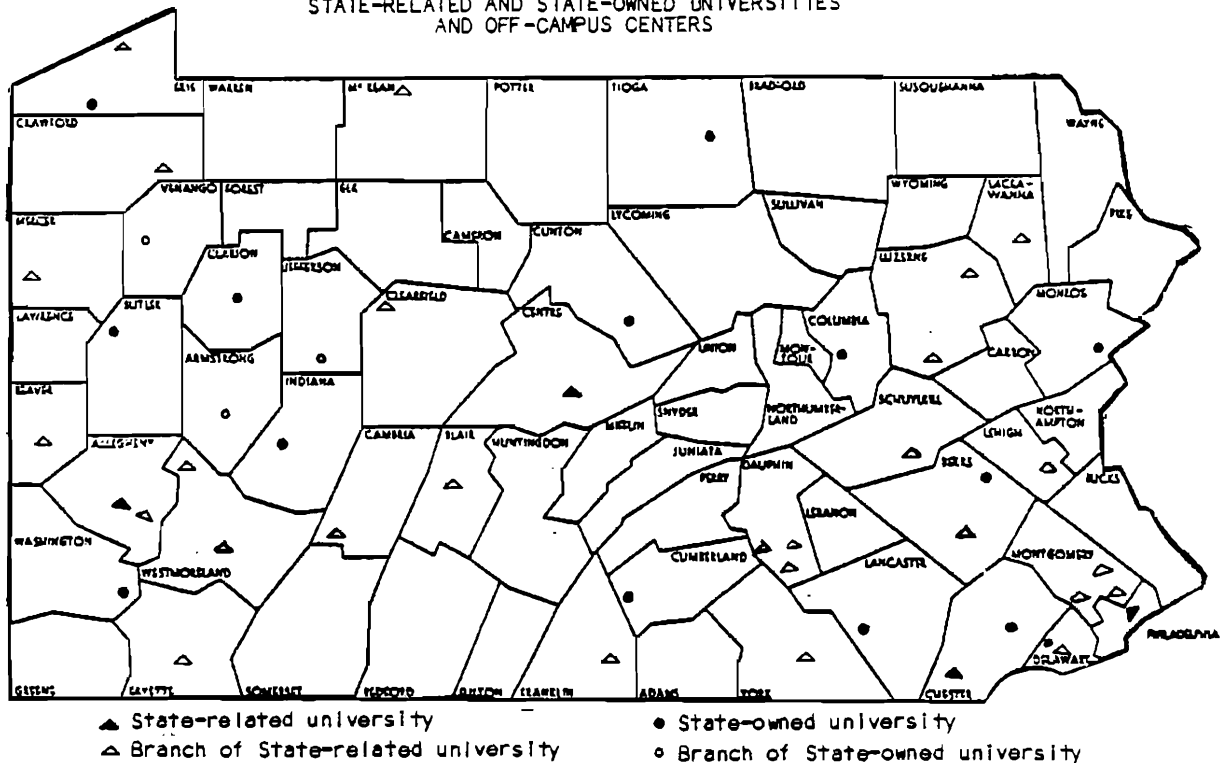


INSTRUCTIONAL OUTPUT AND FACULTY SALARY COSTS OF THE STATE-RELATED AND STATE-OWNED UNIVERSITIES

**Analysis of 1988-89 Data
Reported Under 1988 Appropriation Acts
and Public School Code**

**Staff Report
General Assembly of the Commonwealth of Pennsylvania
JOINT STATE GOVERNMENT COMMISSION
108 Finance Building
Harrisburg, Pennsylvania
February, 1990**

STATE-RELATED AND STATE-OWNED UNIVERSITIES
AND OFF-CAMPUS CENTERS



State-Related Universities

Penn State (Centre)

- Allentown Campus (Lehigh)
- Altoona Campus (Blair)
- Beaver Campus (Beaver)
- Behrend College (Erie)
- Berks Campus (Berks)
- Capitol Campus (Dauphin)
- Delaware Campus (Delaware)
- DuBols Campus (Clearfield)
- Fayette Campus (Fayette)
- Hazleton Campus (Luzerne)
- Hershey Medical Center (Dauphin)
- King of Prussia Center for Graduate Studies (Montgomery)
- McKeesport Campus (Allegheny)
- Mont Alto (Franklin)
- New Kensington (Westmoreland)
- Ogontz Campus (Montgomery)
- Schuylkill Campus (Schuylkill)

Penn State (Centre) (cont.)

- Shenango Valley Campus (Mercer)
- University Center at Harrisburg (Dauphin)
- Wilkes-Barre Campus (Luzerne)
- Worthington Scranton Campus (Lackawanna)
- York Campus (York)
- Pittsburgh (Allegheny)
- Bradford Campus (McKean)
- Greensburg Campus (Westmoreland)
- Johnstown Campus (Cambria)
- Titusville Campus (Crawford)
- Temple (Philadelphia)
- Ambler Campus (Montgomery)
- University Center at Harrisburg (Dauphin)
- Lincoln (Chester)

State-Owned Universities

- Bloomsburg (Columbia)
- California (Washington)
- Cheyney (Delaware)
- Clarion (Clarion)
- Venango Campus (Venango)
- East Stroudsburg (Monroe)
- Edinboro (Erie)
- Indiana (Indiana)
- Armstrong Campus (Armstrong)
- Punxsutawney Campus (Jefferson)

- Kutztown (Berks)
- Lock Haven (Clinton)
- Mansfield (Tioga)
- Millersville (Lancaster)
- Shippensburg (Cumberland)
- Slippery Rock (Butler)
- West Chester (Chester)

FOREWORD

This 17th annual report summarizes and analyzes the instructional outputs, instructional faculty salary costs, tuitions and appropriations for Pennsylvania's State-related and State-owned universities--the Commonwealth's public universities.

1988-89 output, salary cost, tuition and appropriation data provided by the universities and collected from other sources are summarized and significant changes from the previous year noted. Prior years' data for the same variables are presented and underlying trends pointed out. Like last year's report, this report utilizes full-time equivalent (FTE) students as the principal measure of instructional output.

Output and salary data are combined to form a measure of cost efficiency--FTE instructional faculty salary cost per FTE student. Tuition and appropriation data are combined to form a measure of cost sharing--the percentage of total instructional cost borne by taxpayers.

To place the data and analysis for the Commonwealth's public universities into perspective, similar data are introduced for other sectors of higher education in Pennsylvania, for other states, and for the U.S.

ROGER A. MADIGAN
Chairman
Joint State Government Commission

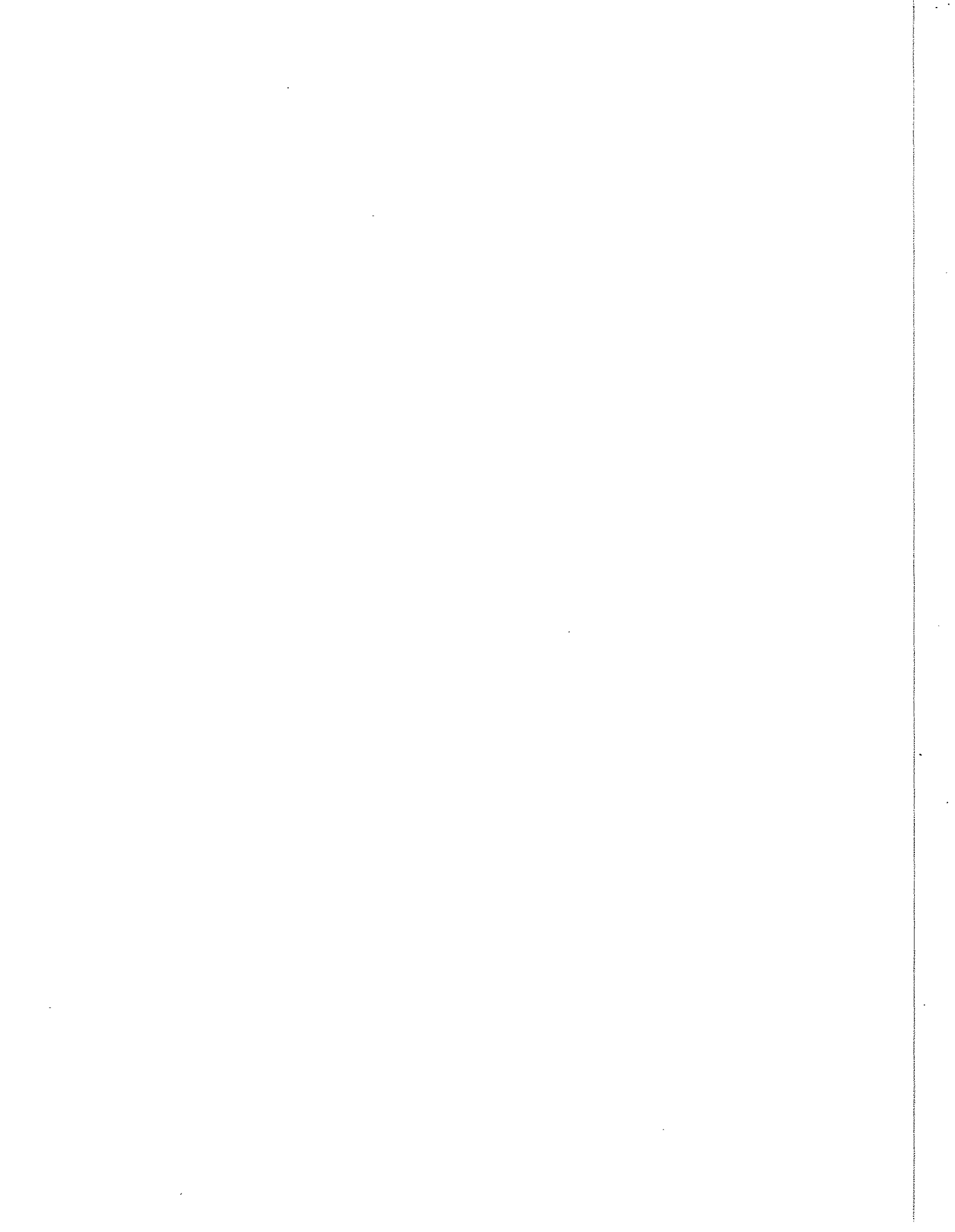


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SUMMARY

1. In Fall 1988, about 42 percent of the total number of full- and part-time students enrolled in colleges and universities in Pennsylvania were enrolled in the Commonwealth's public universities: 137,254 students in the 4 State-related universities and 92,375 in the 14 State-owned universities. During 1988-89, student credit hours were the equivalent of 119,136 full-time students for the State-related group, and 86,655 for the State-owned group. Total student enrollments increased by 3 percent, and full-time equivalent (FTE) students by 2 percent, over the previous year.
2. During the 1988-89 school year, the public universities conferred a total of 37,044 bachelor's and graduate degrees, not including medical degrees: 21,739 degrees by the State-related universities, and 15,305 by the State-owned universities. Total degrees had a one-year increase of 3 percent.
3. Since 1983-84, the total number of FTE students at the public universities has increased by about 8 percent, despite a decrease in the Commonwealth's population of 18- to 24-year-olds of about 14 percent. This increase would appear to be attributable to a larger percentage of Pennsylvania's college-age population attending the Commonwealth's public universities, plus an increase in the enrollment of older students at these institutions.
4. In Fall 1988, the overall workweek of the full-time employed faculty at the public universities averaged 53.5 hours: 52.1 hours at the State-related universities, and 55.5 at the State-owned universities. Hours spent in classroom and individual instruction contact with students averaged 8.4 per week for the State-related group, and 11.8 per week for the

State-owned group. Since 1983-84, average total workweeks for both faculty groups have remained nearly constant, as have student contact hours.

5. During the 1988-89 school year, the public universities employed 11,314 FTE instructional faculty: 6,732 faculty by the State-related universities, and 4,582 by the State-owned universities. The total FTE instructional faculty had a one-year increase of over 1 percent. The salary for this faculty of the two university groups averaged \$32,600 and \$36,700, respectively. The average salary had a one-year increase of 6 percent.
6. Since 1983-84, the average salary for the FTE instructional faculty has increased by about \$7,700 for the State-related universities, and about \$8,600 for the State-owned universities. The relative increase in average salary for the State-owned group has served to widen the gap in average salaries between the two groups of institutions.
7. During 1988-89, the ratio of FTE students to FTE instructional faculty averaged 17.7 for the State-related universities and 18.9 for the State-owned universities. From the previous year, these averages represent a 2 percent increase for the State-related group, and a 1 percent decrease for the State-owned group.
8. For 1988-89, the instructional faculty salary cost per undergraduate level FTE student (undergraduate FTE salary cost) averaged \$1,589 for the public universities: \$1,371 for the State-related group, and \$1,860 for the State-owned group. At the master's level, FTE salary cost averaged \$3,232 and \$2,980 for the two groups, respectively. The undergraduate FTE salary cost had a one-year increase of 3 percent for the State-related group, and 7 percent for the State-owned group; master's FTE salary cost had one-year increases of 4 percent and 5 percent, respectively. FTE salary cost tends to decrease as the number of FTE students increase (at every academic level), and increase as academic levels increase.

9. Statistical analysis of 1988-89 data for the public universities indicates that the total cost savings from decreasing FTE instructional faculty average salaries by \$1,000 would be about \$10 million, and from increasing average class (section) sizes by one student about \$12 million.

10. During fiscal year 1988, the total instructional cost per FTE student at a public institution of higher education in Pennsylvania (including the public universities and community colleges) was \$7,397, the eighth highest in the nation. The higher instructional cost for Pennsylvania would appear to be largely explained by smaller enrollment per institution in Pennsylvania than in the U.S.

11. During 1988-89, main campus tuition and required fees for full-time in-State undergraduate students averaged \$3,435 at the State-related universities, and \$2,333 at the State-owned universities. These tuition and fees had one-year increases of 10 percent and 14 percent for the two groups, respectively.

12. For fiscal year 1988, the Commonwealth's General Fund appropriations to the public universities for instruction totaled \$684.8 million: \$376.0 million to the State-related universities, and \$308.8 million to the State-owned universities. Total instructional appropriations had a one-year increase of 5 percent. The average appropriation per FTE student was \$3,160 for the State-related group, and \$3,560 for the State-owned group. Per student appropriations had one-year increases of 3 percent for both groups. In addition to the appropriations made to the public institutions, the Commonwealth also appropriated funds from the General Fund to the Pennsylvania Higher Education Assistance Agency; about \$49 million of these funds went to students at the public universities through various PHEAA grant and matching fund programs.

13. Since 1983-84, on an FTE student basis, average tuition and fee revenues collected by the public universities have increased by a greater percentage than average direct Commonwealth appropriations. Hence, the percentage of total instructional revenues from taxpayers has decreased, causing the student share of instructional cost to increase for all of the public universities except Lincoln and Cheyney.

14. During fiscal year 1988, the average tuition at a public institution of higher education in Pennsylvania (including the public universities and community colleges) was \$3,242, more than double the U.S. average. Total State and local appropriations per FTE student were \$3,658, more than 22 percent lower than the U.S. average. Overall, Pennsylvania ranks 47th in the nation, with regard to the percentage of total instruction revenue which its public institutions of higher education receive in the form of taxpayer support. On an FTE student basis, total instructional costs in public institutions of higher education in Pennsylvania are higher than the national average. Since per student appropriations are lower than the national average, higher-than-average tuition fills the gap.

I. INTRODUCTION

In Fall 1988, 148 colleges and universities provided post-secondary education to students in Pennsylvania: 4 State-related universities, 14 State-owned universities, 14 community colleges, 11 private State-aided institutions and 105 private independent institutions. These public and private institutions offer students a wide range of choice with regard to size, location, programs, degrees and student charges.

In Fall 1988, 229,629 students were enrolled in Pennsylvania's State-related and State-owned institutions--the Commonwealth's public universities--representing about 42 percent of the total enrollment in all of Pennsylvania's colleges and universities. During fiscal year 1989, the public universities collected almost \$751 million in tuition and fees from students and received about \$685 million in direct appropriations for educational and general expenditures from the Commonwealth. These appropriations represent about 86 percent of the total appropriations made specifically for instruction to the public universities and community colleges, and about 70 percent of the total appropriations made for all purposes to all public and private colleges and universities in the Commonwealth. In addition, students enrolled in the public universities received about \$46 million in Pennsylvania Higher Education Assistance Agency (PHEAA) grants, plus about \$2.8 million in matching fund aid; these funds represent over 31 percent of the total financial aid given by PHEAA to students at all colleges and universities in the Commonwealth.

A large proportion of Pennsylvania students and all Pennsylvania taxpayers therefore have an interest in the Commonwealth's public universities producing the highest quality instruction in the most cost-effective manner, as well as in how the cost of this instruction is shared between students and taxpayers.

This report addresses the important issues of cost efficiency and cost sharing. Using data reported by the individual State-related

universities, as required by their annual appropriation acts, and the individual State-owned universities, as mandated by the Public School Code, the report summarizes and analyzes the number of instructional faculty, faculty output, faculty salaries and faculty workweek activities by type of institution, academic level and program area. Levels of the data for 1988-89, and changes in the data from the previous year and over the past five years are examined. Output and salary data are used to compute a measure of cost efficiency: instructional faculty salary cost per full-time equivalent student. Using tuition and fee collections data reported by the individual State-related universities and the State System of Higher Education, and appropriation data from the General Fund Budget, the report summarizes and analyzes the sharing of instructional costs between the two groups who pay these costs: students and taxpayers. Current year data, plus one- and five-year changes are again examined. Tuition and appropriation data are used to compute a measure of cost sharing: the percentage of total instructional cost borne by taxpayers. The effects of PHEAA programs on the student share of costs are also presented.

The report is thus an in-depth analysis of the educational and general (instructional) functions of the public universities of the Commonwealth. The report does not address the critically important issues of the quality of education provided by Pennsylvania's public universities, or the "fairness" of cost sharing between students and taxpayers in the Commonwealth. These highly complex and controversial issues are beyond the scope of the report.

This research is intended for use by a variety of persons: by legislators for making appropriation decisions; by university administrators for evaluating policies related to faculty output, salaries and workloads; and by Pennsylvania citizens, for making informed judgments about the levels and shares of costs related to public higher education in the Commonwealth.

II. INSTRUCTIONAL OUTPUT

For analyses of instructional output, two alternative measures of output are useful for different purposes. Full-time equivalent (FTE) students, computed from student credit hours, are the best measure by which to compare enrollments between institutions with differing full- and part-time student mixes. In addition, the FTE student measure is helpful in analyzing output by academic level and program area, both of which are closely related to institutional missions and instructional costs.¹ Degrees conferred by student major, related to student interests and career objectives, is a useful measure by which to relate academic output to societal trends and economic conditions.

FULL-TIME EQUIVALENT (FTE) STUDENTS

In Fall 1988, Pennsylvania Department of Education data² indicate that 542,364 full- and part-time students were enrolled in the 148 public and private colleges and universities in the Commonwealth. Of this total, 229,629 students (42 percent) were enrolled in Pennsylvania's public universities: 137,254 students (25 percent) in the State-related universities, and 92,375 (17 percent) in the State-owned universities. Compared to Fall 1987, total enrollments at all of the Commonwealth's colleges and universities increased by 15,529 students (nearly 3 percent); at the public universities, enrollments rose by 6,760 students (almost an identical percentage increase).

During the 1988-89 school year, 6.02 million undergraduate and graduate student credit hours (SCH) were generated by the public universities: 3.46 million SCH (57 percent) by the State-related universities, and 2.56 million (43 percent) by the State-owned universities.³ This SCH output was the equivalent of 119,136 full-time students at the State-related institutions, and 86,655 at the State-owned institutions (table 1).⁴ The number of FTE students in the State-related group ranged from 62,095 at Penn State (main

campus plus branch campuses) to 1,317 at Lincoln, and in the State-owned group from 13,165 at Indiana to 1,241 at Cheyney.

The relationship between student enrollments and FTE students depends upon the mix of full- and part-time students enrolled at the various institutions. In Fall 1988, according to data from the Pennsylvania Department of Education,⁵ the ratios of full-time to total students at Pennsylvania's public universities were as follows: Lincoln, 98 percent; Penn State, 77 percent; Pittsburgh, 67 percent; Temple, 66 percent; State-owned group, 79 percent. The mix of full- and part-time students at the various institutions is related to program offerings, geographical location, local economic conditions, and many other variables.

From 1987-88 to 1988-89 total FTE students at the public universities increased by about 2 percent, and total student enrollment by 3 percent. Therefore, the aggregate full- and part-time mix did not change appreciably. Higher-than-average one-year increases in FTE students were reported by California, Clarion, Edinboro, Kutztown, Lock Haven, Mansfield, Millersville, Slippery Rock and Temple,⁶ and decreases in FTE students by Cheyney, Shippensburg and West Chester.

Output by Academic Level

Tables 1 and 2 show one important dimension of diversity in the Commonwealth's public universities: the number of FTE students by academic level and division. These data indicate that the percentage distribution of FTE students during 1988-89 were as follows:

<u>Institution</u>	<u>Lower division</u>	<u>Upper division</u>	<u>Total under-graduate</u>	<u>Master's</u>	<u>First professional and doctor's</u>	<u>Total graduate</u>
Lincoln	68%	17%	85%	15%	0%	15%
Penn State	61	30	91	5	4	9
Pittsburgh	50	25	75	16	9	25
Temple	42	36	78	11	11	22
State-owned group	66	27	93	7	0	7

The distribution of FTE students by academic levels and divisions at the various institutions primarily reflects the missions and programs of the institutions. The mix between academic levels is especially important, since instructional salary cost per FTE student differs significantly by level and division (see chapter IV of this report).

Output by Program Area

Tables 3A through 3E show another important dimension of diversity in FTE students: the number of FTE students by program area (CIP).⁷ These data indicate that in the State-related institutions and State-owned group about two-thirds of the undergraduate FTE students are in the following program areas:

<u>Institution</u>	<u>Program Areas</u>
Lincoln	Business, Education, Letters, Mathematics, Social Sciences
Penn State	Business, Education, Engineering, Letters, Mathematics, Physical Sciences, Social Sciences
Pittsburgh	Engineering, Health, Letters, Mathematics, Physical Sciences, Psychology, Social Sciences
Temple	Business, Communications, Education, Letters, Mathematics, Social Sciences, Visual and Performing Arts
State-owned group	Business, Education, Letters, Mathematics, Social Sciences, Visual and Performing Arts

Program diversity is related to differing academic missions, and can also influence FTE salary cost (see chapter IV).

DEGREES CONFERRED

During the 1988-89 school year Pennsylvania's public universities conferred 37,044 bachelor's and graduate degrees (not including medical degrees): 21,739 degrees (59 percent) by the State-related institutions, and 15,305 (41 percent) by the State-owned institutions (table 4).⁸ These degrees represent about one-half of the total bachelor's and graduate degrees (not including medical degrees) granted by all colleges and universities in the Commonwealth.⁹ These data indicate that degrees conferred in 1988-89 by type were divided as follows:

<u>Institution</u>	<u>Bachelor's degrees</u>	<u>Graduate degrees</u>
Lincoln	69%	31%
Penn State	82	18
Pittsburgh	60	40
Temple	65	35
State-owned group	85	15

Table 4 shows that, from 1987-88 to 1988-89, total bachelor's and graduate degrees conferred by the public universities increased by 3 percent; this total change reflects a 2 percent increase in bachelor's degrees, and a 4 percent increase in graduate degrees.

FIVE-YEAR OUTPUT TRENDS

FTE Students

Between 1983-84 and 1988-89, total FTE students changed at the public universities as follows:

<u>Institution</u>	<u>Number</u>	<u>Percentage</u>
Lincoln	3	a
Penn State	3,726	6%
Pittsburgh	-58	a
Temple	3,165	14
State-owned group	8,420	11

a. Rounds to less than one percent.

During this time, FTE undergraduate students, relative to FTE graduate students, have increased at the State-related universities, but decreased at many State-owned universities.

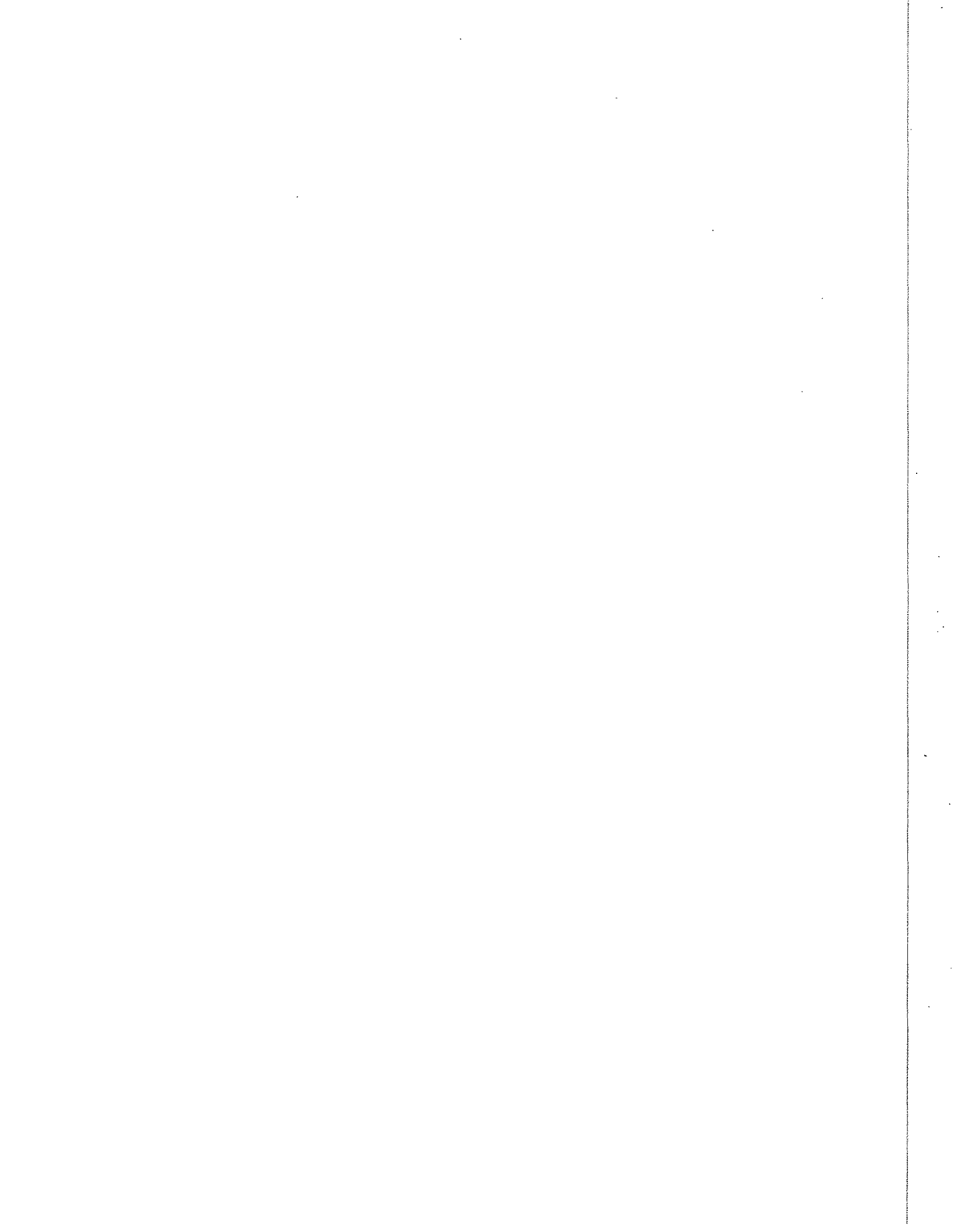
The five-year increase of 15,256 FTE students (8 percent) in Pennsylvania's public universities occurred during a period when the Commonwealth's population of 18- to 24-year-olds was declining by some 200,000 persons (14 percent).¹⁰ This anomaly would appear to be attributable to a larger percentage of Pennsylvania's college-age population attending the Commonwealth's public universities, plus an increase in the enrollment of older students at these institutions.

Degrees Conferred

Between 1983-84 and 1988-89, total bachelor's, master's, first professional (excluding medical) and doctor's degrees conferred changed at the public universities as follows:

<u>Institution</u>	<u>Number</u>	<u>Percentage</u>
Lincoln	47	24%
Penn State	383	4
Pittsburgh	95	2
Temple	471	10
State-owned group	1,057	7

During this time, the number of bachelor's degrees granted by the Commonwealth's public universities has increased relative to the number of graduate degrees granted.



III. INSTRUCTIONAL FACULTY INPUT

The principal input into the generation of instructional output, whether measured by FTE students or degrees, is instructional faculty.¹¹ Other inputs, complementary to faculty in the instructional process such as plant, equipment and administration, are ordinarily not utilized in units directly assignable to specific instructional outputs. To avoid making an essentially arbitrary allocation of such inputs and their costs to instruction, instructional faculty and instructional faculty salary are the only input and cost measures considered in this report.

FULL-TIME EMPLOYED FACULTY AND WORKWEEK ACTIVITIES

In Fall 1988, 10,161 teaching and research faculty were employed full-time by Pennsylvania's public universities: 5,754 (57 percent) by the State-related institutions, and 4,407 (43 percent) by the State-owned institutions (table 5). This set of faculty represents a one-year increase of 132 persons (2.3 percent) for the State-related group, and 89 persons (2.1 percent) for the State-owned group.¹²

Table 5 shows that in Fall 1988, the overall average reported workweek of the full-time employed faculty in the public universities was 53.5 hours: 52.1 hours for the State-related group, and 55.5 hours for the State-owned group. Total workweeks for faculty members at the two university groups increased by 1 percent from Fall 1987.

These data indicate that faculty workweeks were divided into the following activities:¹³

<u>Workweek activity</u>	<u>Lincoln</u>	<u>Penn State</u>	<u>Pitts- burgh</u>	<u>Temple</u>	<u>State- owned group</u>
Instruction:					
Student contact	22.0%	16.6%	15.4%	15.7%	21.3%
Instructional support	<u>35.5</u>	<u>38.2</u>	<u>30.1</u>	<u>28.8</u>	<u>31.7</u>
Total	57.5	54.8	45.5	44.5	53.0
Noninstruction:					
Research	20.5	23.2	32.3	24.2	16.0
Other university service	<u>22.0</u>	<u>22.0</u>	<u>22.2</u>	<u>31.3</u>	<u>31.0</u>
Total	42.5	45.2	54.5	55.5	47.0

For the most part, these divisions of time by function represent little change from the previous year.

Hours spent by the full-time employed faculty in classroom and individual instruction contact with students averaged 8.4 per week for the larger and more research-oriented State-related universities, and 11.8 per week for the State-owned universities. Average student contact hours decreased at Penn State, Pittsburgh and Temple, but increased at Lincoln and many State-owned universities, from Fall 1987.

FTE INSTRUCTIONAL FACULTY EMPLOYED AND AVERAGE SALARIES

In Fall 1988, 17,519 full- and part-time instructional faculty were employed by the Commonwealth's public universities: 12,471 full- and part-time instructional faculty (71 percent) by the State-related universities, and 5,048 (29 percent) by the State-owned universities. Compared to Fall 1987, the full- and part-time instructional faculty at the public institutions increased by 360 (2 percent).

During the 1988-89 school year, these ranked and nonranked instructional faculty were the equivalent of 11,314 full-time instructional faculty: 6,732 FTE instructional faculty (60 percent) at the State-related universities, and 4,582 (40 percent) at the State-owned universities (table 6). Compared to 1987-88, the FTE instructional faculty decreased by 3 (less than 1 percent) at the State-related institutions, and 127 (almost 3 percent) at the State-owned institutions.¹⁴

The overall average instructional salary of the FTE instructional faculty in the public universities was \$34,300: \$32,600 for the State-related group, and \$36,700 for the State-owned group.

These overall salaries represent one-year increases of \$1,700 (6 percent) and \$2,200 (6 percent) for the two groups of institutions, respectively.¹⁵

Average salaries for the FTE instructional faculty at the State-related universities ranged from \$33,700 at Pittsburgh to \$23,100 at Lincoln, and at the State-owned universities from \$41,000 at Cheyney to \$35,200 at East Stroudsburg.

The data in table 6 show that the State-owned universities tend to utilize relatively more higher ranked FTE instructional faculty--professors and associate professors--than do the larger State-related universities; Penn State, Pittsburgh and Temple provide a significant amount of instruction using instructors and nonranked persons (largely graduate teaching assistants).

RELATIONSHIP BETWEEN FTE STUDENTS AND FTE INSTRUCTIONAL FACULTY

The data in tables 1 and 6 can be combined to show the number of FTE students per FTE instructional faculty for the public institutions. For the 1988-89 school year, these data indicate that ratios of FTE students to FTE instructional faculty were as follows:

<u>Institution</u>	<u>Ratio</u>
Lincoln	14.3
Penn State	18.5
Pittsburgh	16.9
Temple	17.0
State-owned group	18.9

From 1987-88 to 1988-89, the overall average ratio of FTE students to FTE instructional faculty increased by about 1 percent.

FIVE-YEAR INPUT TRENDS

Faculty Employed

Between Fall 1983 and Fall 1988, the total full-time employed faculty--the faculty set whose workweek activities are included in this report--has increased by 204 (8 percent) at Penn State, 101 (7 percent) at Pittsburgh, and 32 (3 percent) at Temple, but has

decreased by 2 (3 percent) at Lincoln. For the State-owned universities as a group, the full-time employed faculty has increased by 235 (6 percent).

Between 1983-84 and 1988-89, the total FTE instructional faculty--the faculty set whose instructional outputs and salary costs are the focus of this report--has increased by 300 (10 percent) at Penn State and 31 (2 percent) at Temple, but decreased by 7 (7 percent) at Lincoln and 100 (5 percent) at Pittsburgh. For the State-owned group, the FTE instructional faculty has increased by 369 (9 percent).

Considering these changes, the relative use of part-time faculty has increased at Lincoln, and Pittsburgh, but has decreased at Penn State, Temple and the State-owned group.

Full-Time Employed Faculty Workweek Activities

Between 1983-84 and 1988-89, the average workweeks for both the State-related and State-owned groups have remained nearly constant. During this time, average undergraduate student contact hours per week have decreased by 0.7 (7 percent) at Lincoln, 0.7 (9 percent) at Penn State, 0.7 (14 percent) at Pittsburgh, and 0.8 (13 percent) at Temple, and 0.1 (1 percent) for the State-owned group. Decreases in classroom and individual instruction contact with students have been offset by increases in other faculty activities.

FTE Instructional Faculty Average Salaries

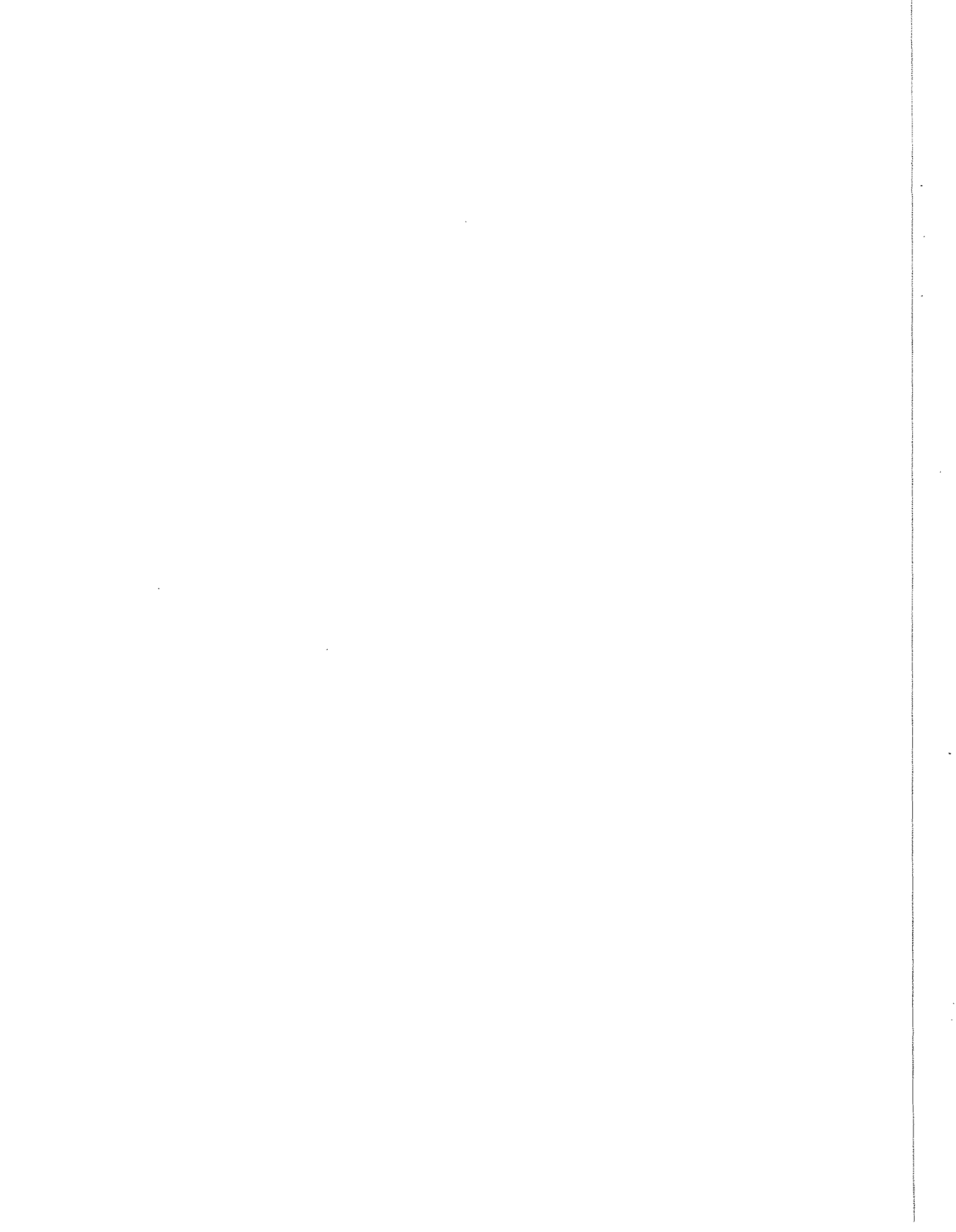
Between 1983-84 and 1988-89, the average instructional salary of the FTE instructional faculty has increased by \$4,900 (27 percent) at Lincoln, \$8,300 (33 percent) at Penn State, \$8,400 (33 percent) at Pittsburgh, \$5,700 (23 percent) at Temple and \$8,600 (31 percent) for the State-owned group. These increases in average salaries were related to two separate factors: (1) changes in the salaries of individual faculty members or groups; and (2) changes in faculty rank distributions. During the five-year interval, the percentage of FTE instructional faculty in the top two faculty ranks (professor and associate professor) has remained the same at Pittsburgh, but decreased by 20 percent at Lincoln, 6 percent at Penn State, 13 percent at Temple, and 9 percent for the State-owned group. Over the past five years, in the State-owned group, a relative decrease in the proportion of top-ranked faculty has been accompanied by a relative increase in the average instructional salary of the FTE instructional faculty, compared to the State-related group.

FTE Student to FTE Instructional Faculty Ratios

Between 1983-84 and 1988-89, the ratio of FTE students to FTE instructional faculty has changed at the public universities as follows:

<u>Institution</u>	<u>1988-89</u>	<u>1983-84</u>
Lincoln	14.3	13.3
Penn State	18.5	19.1
Pittsburgh	16.9	16.0
Temple	17.0	15.3
Bloomsburg	19.0	17.8
California	20.7	19.3
Cheyney	13.5	14.6
Clarion	18.7	18.9
East Stroudsburg	18.2	18.1
Edinboro	18.5	18.0
Indiana	19.6	19.6
Kutztown	19.3	19.5
Lock Haven	18.7	16.9
Mansfield	17.5	17.6
Millersville	19.9	19.3
Shippensburg	19.2	19.2
Slippery Rock	18.6	18.8
West Chester	18.4	18.0

At many of the institutions, this output-input ratio has increased over the past five years.



IV. COST EFFICIENCY

Cost efficiency is the minimization of the input cost of producing a given level of output. In higher education the simplest measure of cost efficiency is instructional cost related to some measure of instructional output. In this report, the cost efficiency measure utilized for Pennsylvania's public universities is instructional faculty salary cost per FTE student.

INSTRUCTIONAL FACULTY SALARY COST PER FTE STUDENT (FTE SALARY COST)

By Academic Level

For the 1988-89 school year, the instructional faculty salary cost per undergraduate-level FTE student (undergraduate FTE salary cost) averaged \$1,612 for Lincoln, \$1,357 for Penn State, \$1,372 for Pittsburgh, \$1,394 for Temple, and \$1,860 for the State-owned group (table 7).

Table 7 shows that the instructional faculty salary cost per master's-level FTE student (master's FTE salary cost) averaged \$1,571 for Lincoln, \$3,077 for Penn State, \$3,759 for Pittsburgh, \$2,657 for Temple, and \$2,980 for the State-owned group.^{16,17}

FTE salary cost varies widely among the individual institutions; however, two important general relationships emerge from the data. First, FTE salary cost tends to vary inversely with the quantity (or scale) of output: for all academic levels (especially the upper undergraduate division), average instructional faculty salary cost per FTE student tends to decrease as the number of FTE students increases. Second, FTE salary cost tends to vary directly with academic levels: for all quantities (scales) of FTE students, FTE salary cost tends to increase as academic level increases.

Compared to 1987-88, the 1988-89 undergraduate instructional faculty salary cost per FTE student increased by \$99 (7 percent) at Lincoln, \$89 (7 percent) at Penn State, but decreased by \$10 (1 percent) at Pittsburgh, and \$47 (3 percent) at Temple. For the State-owned universities as a group, undergraduate FTE salary cost increased by \$124 (7 percent); larger-than-average one-year increases occurred at Clarion, Edinboro, Indiana, Mansfield, Shippensburg, Slippery Rock, and West Chester, and a decrease for California.

By Program Area

In both types of public universities, FTE salary cost varies considerably by program area (tables 8A through 8E). Program areas (CIP) with substantially higher than average undergraduate FTE salary cost ("high-cost" CIP) include:

<u>Institution</u>	<u>Program Areas</u>
Lincoln	Physical Sciences, Social Sciences
Penn State	Agriculture, Architecture and Environmental Design, Area and Ethnic Studies, Engineering, Health, Library and Archival Sciences, Multi/interdisciplinary Studies, Parks and Recreation, Public Affairs and Protective Services, Trade and Industrial
Pittsburgh	Education, Engineering, Foreign Language, Health, Library and Archival Sciences
Temple	Agriculture, Area and Ethnic Studies, Computer and Information Sciences, Engineering, Health, Law, Visual and Performing Arts
State-owned group	Agriculture, Architecture and Environmental Design, Engineering, Health, Industrial Arts, Library and Archival Sciences, Physical Sciences, Trade and Industrial

Tables 8A through 8E confirm that FTE salary cost tends to vary inversely with scales of output, and directly with academic levels.

DETERMINANTS OF COST EFFICIENCY

The appendix to this report presents a model of FTE salary cost determination. This model shows that there are three variables which university administrators can control (at least to some extent) to influence FTE salary cost, or cost efficiency: FTE instructional faculty average salary, class (section) average size, and the number of classes (sections) offered per course.

FTE Instructional Faculty Average Salary

FTE instructional faculty average salaries tend to vary directly with faculty ranks (see table 6). Since faculty ranks also tend to correlate positively with academic levels, faculty average salaries tend to vary directly with academic levels.¹⁸ Therefore, FTE instructional faculty average salary has a positive effect on FTE salary cost by academic level.

Class (Section) Average Size

Class (section) average sizes tend to vary inversely with academic levels: lower-division undergraduate classes are generally larger in size than upper-division classes, and upper-division classes typically larger than master's level classes (table 9). Thus class (section) average size has a negative effect on FTE salary cost by academic level.

Number of Classes (Sections) Offered per Course

The number of classes (sections) offered per course tends to vary inversely with academic levels, but positively with the number of FTE students at each academic level. On balance, the number of classes (sections) offered per course has a positive effect on FTE salary cost by academic level.¹⁹

REGRESSION ANALYSIS OF COST EFFICIENCY

The model of FTE salary cost in the appendix can be statistically validated and quantitative estimates of the control

variables made using the technique of multiple regression analysis. The regression equation which results from the model is:²⁰

$$\ln Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2$$

where:

Y = instructional faculty salary cost per FTE student (\$)

X₁ = FTE instructional faculty average salary (\$)

X₂ = class (section) average size

b₀, b₁ and b₂ are regression coefficients to be estimated from the data; ln is the natural logarithm.

Separate regressions were estimated for the State-related and State-owned university groups, using data for the 1988-89 school year for the lower- and upper-divisions and various CIP for each university.²¹ The coefficient estimates obtained for the control variables are as follows:

Control variable	State-related universities		State-owned universities	
	Lower division	Upper division	Lower division	Upper division
ln X ₁	1.05	.93	1.01	.95
ln X ₂	-.87	-.68	-.85	-.87

All of the coefficient estimates are statistically significant at the 5 percent confidence level or better, and all have the expected sign: FTE salary cost is positively correlated with FTE instructional faculty average salary, and negatively correlated with class (section) average size. The model displays considerable explanatory power: the regressions explain from 64 to 73 percent of the variation in FTE salary cost across program areas, depending upon institutional type and academic level.

The quantitative values of the coefficients indicate that, for example, in the lower division of the State-related universities, a 1 percent increase in the average instructional salary of the FTE instructional faculty (with all other control variables held constant) could be expected to increase FTE salary cost by 1.05 percent. Conversely, a 1 percent increase in class (section) average size (all else equal) could be expected to decrease FTE salary cost by .87 percent. At the lower division, for a given percentage change in

either faculty salary or class (section) size, the percentage impact on FTE cost would be expected to be greater for the State-related group than the State-owned group; at the upper division, the opposite is true.

These regression results can be used to estimate the overall reductions in FTE salary cost which would be expected to result from several feasible policy actions by university administrators:

<u>Policy action</u>	<u>State-related universities</u> <u>(\$000)</u>		<u>State-owned universities</u> <u>(\$000)</u>		<u>Total (\$000)</u>
	<u>Lower division</u>	<u>Upper division</u>	<u>Lower division</u>	<u>Upper division</u>	
<u>Decrease FTE instructional faculty average salaries by \$1,000</u>	\$2,900	\$2,300	\$2,600	\$2,000	\$9,800
<u>Increase class (section) average sizes by one student each</u>	\$2,100	\$2,300	\$2,900	\$4,900	\$12,200

In other words, for the public universities, the total cost savings from decreasing FTE instructional faculty average salaries by \$1,000 would be nearly \$10 million, and from increasing average class (section) sizes by one student each over \$12 million.

FIVE-YEAR COST-EFFICIENCY TRENDS

Between 1983-84 and 1988-89, average instructional faculty salary cost per FTE undergraduate student (undergraduate FTE salary cost) has increased by \$229 (17 percent) at Lincoln, \$345 (34 percent) at Penn State, \$219 (19 percent) at Pittsburgh, \$92 (7 percent) at Temple, and \$417 (29 percent) for the State-owned group. Master's level FTE salary cost has increased by \$247 (19 percent) at Lincoln, \$912 (42 percent) at Penn State, \$1,024 (37 percent) at Pittsburgh, \$486 (22 percent) at Temple, and \$319 (12 percent) for the State-owned group.

The five-year increases in FTE salary cost are primarily related to increases in FTE instructional faculty average salaries since, in the aggregate, class sizes have increased or remained unchanged at all academic levels.

INTERSTATE COMPARISON OF COST EFFICIENCY

Due to insufficient data, it is presently not possible to compare the cost efficiency of public institutions of higher education in the various states, with cost efficiency defined by the FTE salary cost measure developed above. However, data are available to make interstate comparisons based on a cost measure related to FTE salary cost: total instructional cost per FTE student (FTE total instructional cost). The FTE total instructional cost measure includes the instructional faculty salaries contained in FTE salary cost as defined above, but also includes other related costs, allocated to instruction. Thus, FTE total instructional cost is more comprehensive than FTE salary cost, but contains an element of arbitrariness not present in FTE salary cost (see introduction to chapter III of this report).

For fiscal year 1988, the U.S. weighted average total instructional cost per FTE student, computed for all publicly controlled institutions of higher education, was \$6,602 (table 10). The total instructional cost per FTE student for all of Pennsylvania's public institutions--including the public universities and community colleges--was \$7,397, about 12 percent higher than the U.S. average and eighth highest in the nation.

The higher-than-average FTE total instructional cost for Pennsylvania would appear to be largely explained by the smaller average size (scale) of the Commonwealth's public colleges and universities: the average number of FTE students per public campus is about 15 percent lower in Pennsylvania than in the U.S. as a whole.

V. COST SHARING

For the most part, the instructional costs of Pennsylvania's public universities are covered by tuition and fee revenues collected from students plus monies appropriated by the General Assembly. Tuition and fees are not necessarily borne totally by students; students receive financial assistance from many sources. The Commonwealth gives financial aid to students at its public universities in two forms: grants under the State Higher Education Grant Program, and loans from or student employment by the public universities under various State matching fund programs. These financial aid programs, administered by the Pennsylvania Higher Education Assistance Agency (PHEAA) and funded through the General Fund Budget, assist students in paying tuition plus other college-related expenses. PHEAA also administers Federal interest-subsidized and payment-guaranteed loans from private lenders under the State Guaranteed Student Loan and PLUS programs. Properly computed student and public shares of the total cost of instruction at the Commonwealth's public universities must consider all of these factors.

STUDENT TUITION AND FEES

Tuition and Fees for Full-Time Students

Tuition and required fees for students at the State-related universities are determined by the individual institutions. A single tuition for students at the State-owned universities is set by the State System of Higher Education; required student fees are set by the individual institutions.

Pennsylvania Department of Education data indicate that, for the 1988-89 academic year, tuition and fee charges for in-State full-time undergraduate students at the State-related universities ranged from \$3,894 (Temple) to \$2,400 (Lincoln), and for in-State full-time graduate students from \$4,632 (Pittsburgh) to \$3,250

(Lincoln) (table 11). For students at the State-owned universities, the basic tuition for Pennsylvania residents was \$2,130 for both full-time undergraduates and graduates;²² required student fees for in-State full-time undergraduates ranged from \$370 (California) to \$60 (Lock Haven), and for in-State full-time graduates from \$370 (California) to \$60 (Bloomsburg and Lock Haven). At Lincoln, tuition and fees for nonresident full-time undergraduates exceeded those for residents by about 46 percent, and for graduates by about 49 percent. At Penn State and Pittsburgh, tuition and fees for nonresident full-time undergraduates and graduates were approximately double those for residents. At Temple, the out-of-State premium was about 75 percent for full-time undergraduates and about 25 percent for graduates. At the State-owned universities, nonresident undergraduates paid about 61 percent more, but nonresident graduates only about 12 percent more, than Pennsylvania residents.

Table 11 shows that tuition and fees at Lincoln had a one-year increase of 12 to 30 percent. In all categories, tuition and fees at Penn State and Pittsburgh rose by 10 percent, and at Temple by 9 percent. At the State-owned universities, the basic tuition charge for in-State full-time undergraduates and graduates increased by about 16 percent (reduced to 14 percent for the Spring semester); required student fees for in-State undergraduates decreased by an average of 2 percent, and for in-State full-time graduates increased by an average of 1 percent.

Tuition and Fee Revenues Collected

During fiscal year 1989, tuition and fee revenues collected by the Commonwealth's public universities from students totaled \$750.7 million: \$541.4 million (72 percent) by the State-related universities, and \$209.3 million (28 percent) by the State-owned universities (table 12). These tuition and fee revenues represent one-year average increases of 13 percent for the State-related group and 17 percent for the State-owned group.

Table 12 shows that per FTE student tuition and fee revenues varied considerably among the public institutions, from \$4,940 (Pittsburgh) to \$3,140 (Lincoln) in the State-related group, and from \$2,730 (Cheyney) to \$2,170 (California) in the State-owned group. On an FTE student basis, collections for the State-related group, increased by 10 percent, and the State-owned group by 14 percent, over the previous year.

COMMONWEALTH APPROPRIATIONS

Direct Appropriations to the State-Related Universities and the State System of Higher Education for Educational and General Expenditures

During fiscal year 1989, appropriations made to the public universities from the Commonwealth's General Fund Budget for educational and general expenditures totaled \$684.8 million: \$376.0 million (55 percent) to the individual State-related universities, and \$308.8 million (45 percent) to the State System of Higher Education for distribution to the individual State-owned institutions according to an allocation formula (table 13).²³ These appropriations represent about 86 percent of the total appropriations made specifically for instruction to the public universities and community colleges, and about 70 percent of the total appropriations made for all purposes to all public and private colleges and universities, in the Commonwealth. Total appropriation revenues increased by 5 percent for both the State-related and State-owned groups over the previous year.

Table 13 indicates that per FTE student appropriation or allocation revenues varied substantially among the individual institutions. Direct appropriations per FTE student ranged from \$6,310 (Lincoln) to \$2,430 (Penn State). SSHE allocations per FTE student ranged from \$10,060 (Cheyney) to \$3,240 (California). Per FTE student appropriations and allocations each increased by an average of 3 percent over the previous year.

As FTE students increase both Commonwealth appropriations and SSHE allocations per student tend to decrease. This inverse relationship indicates that both the State appropriation process and the SSHE allocation process recognize economies of scale in the instructional process.

Appropriations to the Pennsylvania Higher Education Assistance Agency for Financial Aid to the Commonwealth's Public University Students

The Governor's Executive Budget shows that, for fiscal year 1989, Commonwealth appropriations from the General Fund to the Pennsylvania Higher Education Assistance Agency totaled about \$155 million; of this amount, PHEAA data²⁴ indicate that about \$49 million, or over 31 percent, was used for grant and matching fund programs for students enrolled at Pennsylvania's public universities. This financial aid from PHEAA for fiscal year 1989 to the public universities and their students increased over 8 percent from fiscal year 1988.

During academic year 1988-89, the Pennsylvania Higher Education Assistance Agency awarded over \$30 million (average academic-year award \$1,258) to 26,297 undergraduates (31 percent of the fall full-time undergraduate enrollment at the State-related universities, and over \$15 million (average award \$833) to 20,317 undergraduates (29 percent of the fall full-time undergraduate enrollment) at the State-owned universities, under the State Higher Education Grant Program. The awards to State-related university students amounted to over 27 percent and to State-owned university students about 14 percent of the total dollar value of the grants made to students in all institutions of higher education in Pennsylvania under this grant program. These awards need not be repaid to PHEAA.

During academic year 1988-89 PHEAA disbursed State funds as allocations to institutions and aid to students in the total amounts of \$1,424,539 to the State-related universities and \$1,356,846 to the State-owned universities under the State Matching Fund Program. These funds were used by the institutions for Perkins Loans (NDSL), nursing student loans, and as matching funds for various work-study programs, internships, etc.

In the same year PHEAA administered federal interest-subsidized and payment-guaranteed loans by private lenders to students at the public universities, under the State Guaranteed Student Loan and PLUS programs. At the present time, data on the numbers and amounts of student loans for 1988-89 are not available.

COST SHARING

For 1988-89, the ratio of Commonwealth appropriations to total revenues from tuition, fees and appropriations--total instructional revenues--was 67 percent for Lincoln, 36 percent for Penn State, 42 percent for Pittsburgh, and 48 percent for Temple (table 14). The share of Commonwealth support for instructional activities decreased at all of the Commonwealth's public universities over the previous year.

For the same year, the ratio of Commonwealth funds to total instructional revenue varied by State-owned institution, ranging from 79 percent for Cheyney to 57 percent for West Chester. Allocations to the State-owned universities averaged 60 percent of total instructional revenues, a 3 percent decrease from 1987-88.

Per FTE student, PHEAA grants and matching funds ranged from \$275 at Pittsburgh to \$224 at Lincoln in the State-related group, and from \$281 at Cheyney to \$107 at West Chester in the State-owned group.

On an FTE student basis, the PHEAA aid in these programs averaged 6 percent of tuition and fee revenues collected for the State-related universities, and 8 percent for the State-owned institutions.

FIVE-YEAR COST-SHARING TRENDS

Between 1983-84 and 1988-89, the average tuition and fee revenues collected per FTE student have increased by 26 percent at Lincoln, 68 percent at Penn State, 55 percent at Pittsburgh, 35 percent at Temple, and 56 percent for the State-owned universities as a group. Over the same interval, the average direct Commonwealth educational and general appropriation per FTE student has increased by 80 percent at Lincoln, 28 percent at Penn State, 37 percent at Pittsburgh, and 22 percent at Temple. The average Commonwealth funds per FTE student has increased by 21 percent for the State-owned university group.

The more rapid growth of tuition and fee revenues relative to appropriation and allocation revenues, on a per student basis, has served to decrease the share of total instructional revenue from taxpayers for all of Pennsylvania's public universities except Lincoln and Cheyney:

<u>Institution</u>	<u>1988-89</u>	<u>1983-84</u>
Lincoln	67%	58%
Penn State	36	42
Pittsburgh	42	45
Temple	48	50
Bloomsburg	61	65
California	60	70
Cheyney	79	76
Clarion	60	67
East Stroudsburg	58	66
Edinboro	58	67
Indiana	58	63
Kutztown	58	63
Lock Haven	65	71
Mansfield	65	70
Millersville	58	64
Shippensburg	60	66
Slippery Rock	59	63
West Chester	57	63

During the same five years, the number of students receiving PHEAA grants decreased to about 31 from about 35 percent of the fall full-time undergraduate students at the State-related universities, and to about 29 from about 32 percent of these students at the State-owned universities. The average full-year grant amount per recipient increased to \$1,258 from \$800 (57 percent), and to \$833 from \$560 (49 percent), respectively, for the two groups of schools. The percentage of total student charges covered by PHEAA grants (i.e., tuition, fees, room and board) increased to about 18 percent from about 16 percent during this time.

INTERSTATE COMPARISON OF COST SHARING

The Integrated Postsecondary Education Data System (IPEDS) shows that during fiscal year 1988 the average tuition revenue per FTE student in all of Pennsylvania's public institutions--including the public universities and community colleges--was \$3,242, more than double the U.S. average for all public colleges and universities (table 15). In 23 states the average tuition for public institutions was higher than the U.S. average. In only three states, however, was the average per student tuition higher than that in Pennsylvania.

On the other hand, the IPEDS data show that total Commonwealth and local direct appropriations to Pennsylvania's public institutions amounted to \$3,658 per FTE student, over 22 percent lower than the U.S. average. Thirty-one states made direct appropriations to public higher education which were lower than the national average. In only six states, however, was the average per student appropriation lower than that in Pennsylvania. Overall, Pennsylvania ranks 47th in the nation, with respect to the percentage of total instructional revenue which its public colleges and universities receive in the form of direct taxpayer support.

Of course, direct appropriations for instructional purposes are not the only source of public support for higher education; appropriations for financial aid must also be considered. However, for fiscal 1988, reliable State and local financial aid data are not available for interstate comparisons. In addition, in any comparisons between states, varying institutional mixes--medical schools, research universities, four-year institutions, two-year institutions, etc.--play a large role in determining statewide revenues and costs.

However, the data clearly show that, on an FTE student basis, total State and local support to all publicly controlled colleges and universities in Pennsylvania is considerably lower than, and total instructional costs somewhat higher than, the national averages. Higher-than-average tuition tends to fill the gap.

APPENDIX: MODEL OF FTE SALARY COST DETERMINATION

Average instructional faculty salary cost per student credit hour, at each academic level and in each program area, can be expressed by the following model:

$$\frac{\text{Instructional FTE faculty salaries}}{\text{Student credit hours}} = \left\{ \frac{\text{Number of FTE instructional faculty}}{\text{Number of courses}} \times \text{Average course (assigned) credit value} \right\} \times \left\{ \frac{\text{FTE instructional faculty average salary}}{\text{Number of classes}} \times \text{Average class size} \right\}$$

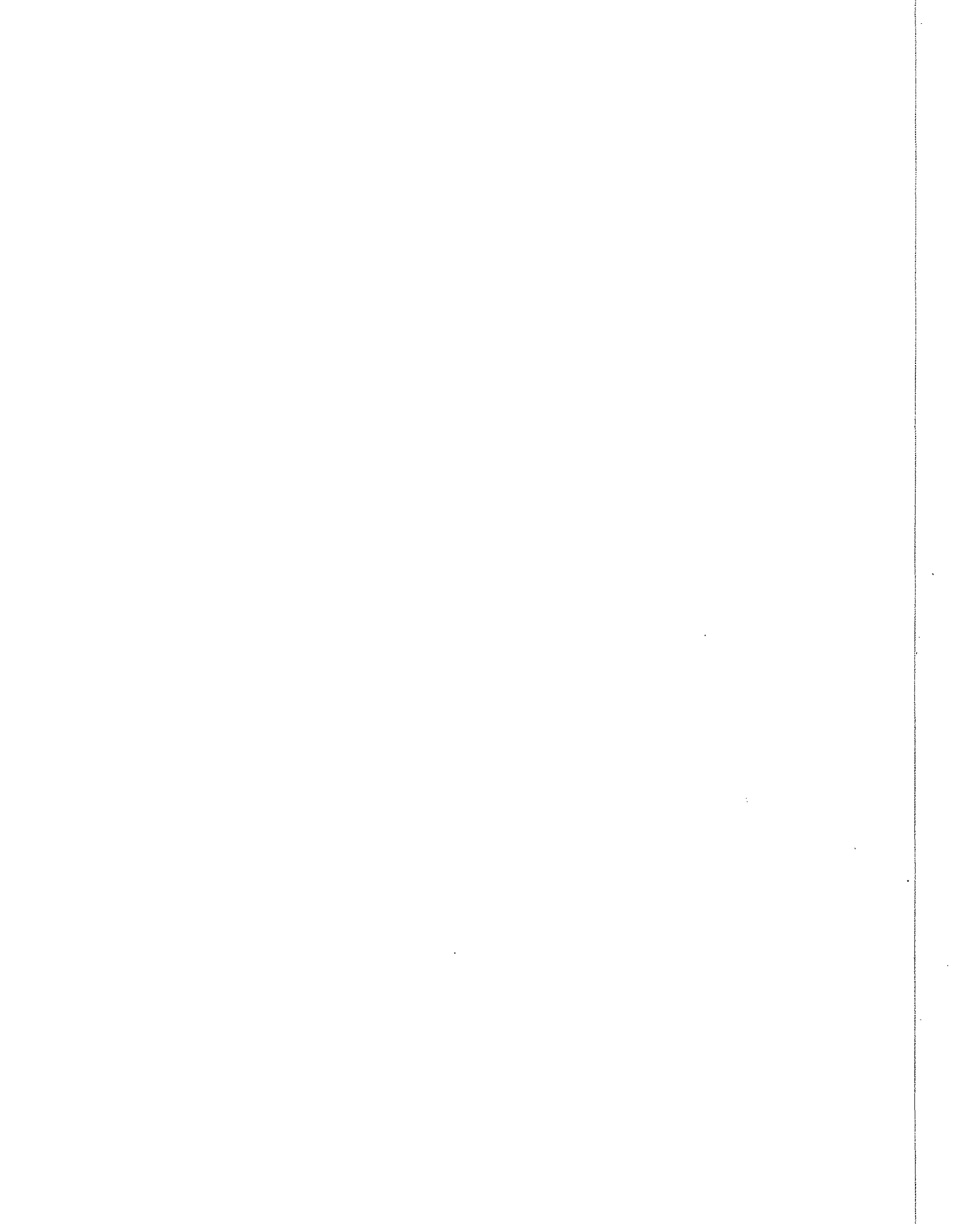
Instructional faculty salary average cost per FTE student, or FTE salary cost, equals the cost per student credit hour times 30 for undergraduate students, and times 24 for graduate students.

The two terms on the right-hand side of this equation illustrate the two different kinds of factors which determine FTE salary cost.

The components of the first term are approximately constants or constant relationships. In the short run, neither the number of faculty per course nor the average assigned credit per course can readily be varied to influence FTE salary cost.

The second term contains control variables: instructional faculty average salary, class (section) average size, and the number of classes (sections) per course. To at least some degree, each of these variables can be controlled by university administrators to affect FTE salary cost. Adjustments in the number of classes (sections) per course are an alternative to permitting average class size to change with changes in enrollment.

This model is the basis for the multiple regression analysis of FTE salary cost in chapter IV of this report.



FOOTNOTES

¹Like last year's report, this year's report utilizes full-time equivalent (FTE) students as the principal measure of instructional output. For comparisons of institutions across various sectors of higher education, the FTE student measure is the most commonly used measure. An historical time series for FTE students at the Commonwealth's public universities, as well as for most other data presented in this report, is available from the staff of the Joint State Government Commission.

²Pennsylvania Department of Education, Higher Education Fall Enrollments, 1988.

³Unless otherwise noted, all data in this report apply to the indicated school year, which includes the summer term preceding the academic year, plus the fall and spring terms of the academic year. For example, the 1988-89 school year includes the summer and fall terms of 1988 plus the spring term of 1989.

⁴Full-time equivalent students are calculated by dividing undergraduate student credit hours by 30 and graduate student credit hours by 24.

⁵See footnote 2.

⁶Beginning with the summer session of 1988, Temple University began introducing a new Core Curriculum, which impacts upon several undergraduate level measures included in this report: undergraduate classroom and individual instruction student credit hours (FTE students), and student contact hours, are all lower as a result. The decrease in undergraduate student credit hours is more than offset by a 7.5 percent increase in new undergraduate students for the fall semester. One- and five-year comparisons are made for Temple in the report; however, consideration must be given to this structural change in evaluating the data changes.

⁷Tables 3A through 3E employ the Classification of Instructional Programs (CIP) taxonomy. The CIP taxonomy was introduced by the U.S. Department of Education's National Center for Education Statistics in 1981. This report utilizes an aggregation of two-digit CIP, each of which corresponds to one or more academic departments or program areas within individual institutions. The CIP groupings are used to facilitate comparisons between institutions, given the large array of departments and programs which exist in the Commonwealth's public universities.

⁸All of the public universities also award associate degrees. Associate degrees are not included in this report.

⁹This ratio is an approximation, based on data for several prior years, since current-year degree data for community colleges, and private State-aided, private independent, and other private institutions in the Commonwealth are not available at this time.

¹⁰U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 1044, State Population and Household Estimates, With Age, Sex, and Components of Change: 1981-88, U.S. Government Printing Office, Washington, D.C., 1989, table 8.

¹¹For fiscal year 1987, instructional faculty salaries comprised about 41 percent of total expenditures for "instruction" for the State-related group, and over 61 percent for the State-owned group, as reported in the Integrated Postsecondary Education Data System (IPEDS). IPEDS data provided by the Pennsylvania Department of Education.

¹²Faculty who are employed, full-time, by the public universities, and who are engaged in teaching, research or both, comprise the set of faculty whose workweek activities are reported by the universities, and summarized in table 5. Note that this is not the same set of faculty whose headcounts and instructional salaries are included in table 6. See footnote 13.

¹³Instructional support includes course preparation and evaluation. Other university service includes public service, institutional support and student services.

¹⁴Full-time instructional faculty, plus the full-time equivalency of part-time instructional faculty, comprise the set of faculty whose instructional salaries are reported by the universities, and summarized in table 6. Note that this is not the same set of faculty whose workweek activities are included in table 5. See footnote 11.

¹⁵In Caveat: Average instructional salaries are computed by dividing each institution's total instructional salaries for each academic rank by the respective number of FTE faculty. Therefore, changes in average salaries do not necessarily correspond to general salary changes for all faculty members in a given institution. Average salary changes also reflect changes in the rank distributions of faculty.

¹⁶In reports prior to February 1989, cost efficiency was measured by instructional faculty salary cost per student credit hour (SCH cost). FTE salary cost (the present report) and SCH cost (previous reports) are related as follows: undergraduate FTE salary cost equals 30 times undergraduate SCH cost; master's FTE cost equals 24 times master's SCH cost. For 1988-89, the undergraduate SCH cost averaged \$54 for Lincoln, \$45 for Penn State, \$46 for Pittsburgh, \$46 for Temple, and \$62 for the State-owned group. Master's SCH cost averaged \$66 for Lincoln, \$128 for Penn State, \$157 for Pittsburgh, \$111 for Temple, and \$124 for the State-owned group.

¹⁷First professional FTE salary cost averaged \$1,584 for Pittsburgh and \$2,869 for Temple. Doctoral FTE salary cost averaged \$9,817 for Penn State, \$8,168 for Pittsburgh and \$5,205 for Temple.

¹⁸The positive relationship between faculty ranks and academic levels is not strictly monotonic for either the State-related or State-owned facilities. However, the degree of positive correlation is strong for both groups.

¹⁹Administrators can change the number of classes (sections) offered per course as an alternative to permitting changes in class size to occur as student demands vary. Thus class (section) average size and the number of classes (sections) offered per course are negatively correlated.

²⁰This regression equation is a logarithmic transformation of the linear FTE salary cost equation derived in the appendix. The transformed equation is used to account for nonlinearities between the various X's and the Y. Notice that the regression equation does not include the number of classes (sections) as an explanatory variable. As noted above, variations in the number of classes and class average size are alternative policy actions. Therefore, inclusion of both variables in the regression would be both conceptually and statistically incorrect.

²¹The actual regression data are not included in this report. These data and all other regression details are available from the staff of the Joint State Government Commission.

²²The basic tuition for Pennsylvania residents was reduced to \$2,078 for the Spring semester of 1989, following an additional appropriation to SSHE.

²³The Commonwealth appropriation to the State System of Higher Education included here does not include amounts appropriated for either the Board of Governors/Chancellor's Office or the System Reserve. Over the years, educational and general appropriations have been expanded to include expenditure categories which previously had been separate line items in the General Fund Budget. In this report, total educational and general appropriations are regarded as "instructional" and used for comparisons, because these appropriations are available to the public institutions for instructional purposes.

²⁴Data provided by the Pennsylvania Higher Education Assistance Agency.

TABLES

Table 1

FULL-TIME EQUIVALENT STUDENTS BY ACADEMIC LEVEL¹
 1988-89, CHANGE FROM 1987-88 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1983-84 to 1988-89)

Institution	Total				Undergraduate				Graduate ²			
	FTE students	One-year change	Percentage change		FTE students	One-year change	Percentage change		FTE students	One-year change	Percentage change	
			One-year	Five-year average			One-year	Five-year average			One-year	Five-year average
State-related												
Lincoln	1,317	14	1%	a	1,116	8	1%	a	201	6	3%	0%
Penn State	62,095	1,234	2	1%	56,271	1,094	2	1%	5,824	140	2	4
Pittsburgh	29,271	479	2	a	21,814	512	2	a	7,457	-33	a	-1
Temple	26,453	807	3	3	20,614	681	3	4	5,839	126	2	-1
Total	119,136	2,534	2	1	99,815	2,295	2	1	19,321	239	1	a
State-owned												
Bloomsburg	6,794	13	a	2	6,400	19	a	2	394	-6	-2	5
California	5,997	453	8	6	5,509	426	8	6	488	27	6	10
Cheyney	1,241	-279	-18	-8	1,081	-321	-23	-9	160	42	36	24
Clarion	6,284	326	5	2	5,889	335	6	2	395	-9	-2	13
East Stroudsburg	4,824	96	2	3	4,344	161	4	3	480	-65	-12	9
Edinboro	6,673	568	9	3	6,279	522	9	3	394	46	13	2
Indiana	13,165	-8	a	a	12,357	76	1	a	808	-84	-9	-1
Kutztown	6,532	198	3	4	6,229	205	3	4	303	-7	-2	7
Lock Haven	2,970	136	5	3	2,970	136	5	3	na	na	na	na
Mansfield	2,830	224	9	1	2,645	185	8	a	185	39	27	17
Millersville	6,914	325	5	2	6,084	216	4	1	830	109	15	15
Shippensburg	5,901	-57	-1	1	5,419	-40	-1	2	482	-17	-3	-1
Slippery Rock	6,947	361	5	3	6,598	292	5	3	349	69	25	7
West Chester	9,583	-327	-3	3	8,657	-330	-4	2	926	3	a	10
Total	86,655	2,029	2	2	80,461	1,882	2	2	6,194	147	2	7
All institutions	205,791	4,563	2	2	180,276	4,177	2	2	25,515	386	2	1

1. Data for each year represent the summer term preceding the academic year plus the academic year. Full-time equivalent students are calculated by dividing undergraduate student credit hours by 30 and graduate student credit hours by 24.

2. In addition to the master's level, graduate for Penn State, Pittsburgh, Temple and Indiana includes first professional (excluding medical schools) and/or doctor's levels.

a. Rounds to less than 1 percent.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1984 to 1989.

Table 2

FULL-TIME EQUIVALENT STUDENTS BY ACADEMIC DIVISION AND LEVEL¹
 1988-89, CHANGE FROM 1987-88 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1983-84 to 1988-89)

Institution	Lower division			Upper division			Master's			First professional and doctor's ²		
	FTE students	Percentage change		FTE students	Percentage change		FTE students	Percentage change		FTE students	Percentage change	
		One-year	Five-year average		One-year	Five-year average		One-year	Five-year average		One-year	Five-year average
State-related												
Lincoln	891	1%	-1%	225	1%	3%	201	3%	0%	na	na	na
Penn State	37,684	a	1	18,587	6	a	3,222	9	9	2,602	-4%	-1%
Pittsburgh	14,526	4	a	7,288	-1	a	4,728	2	-1	2,729	-4	-2
Temple	10,983	4	6	9,631	2	2	2,888	4	1	2,951	1	-2
Total	64,084	2	2	35,731	4	1	11,039	4	2	8,282	-3	-2
State-owned												
Bloomsburg	4,545	1	3	1,855	-2	a	394	-2	5	na	na	na
California	3,757	7	3	1,752	10	13	488	6	10	na	na	na
Cheyney	849	-23	-9	232	-23	-9	160	36	24	na	na	na
Clarion	4,266	6	1	1,623	5	4	395	-2	13	na	na	na
East Stroudsburg	3,292	3	3	1,052	6	a	480	-12	9	na	na	na
Edinboro	4,590	13	3	1,689	a	5	394	13	2	na	na	na
Indiana	8,417	2	1	3,940	-1	a	808	-9	-1	b	b	b
Kutztown	4,261	2	4	1,968	7	2	303	-2	7	na	na	na
Lock Haven	2,145	7	2	825	a	7	na	na	na	na	na	na
Mansfield	1,984	10	a	661	0	a	185	27	17	na	na	na
Millersville	4,367	a	-1	1,717	13	9	830	15	15	na	na	na
Shippensburg	3,979	a	2	1,440	-3	1	482	-3	-1	na	na	na
Slippery Rock	5,002	6	3	1,596	a	4	349	25	7	na	na	na
West Chester	5,983	-6	1	2,674	1	5	926	a	10	na	na	na
Total	57,437	3	2	23,024	2	3	6,194	2	7	na	na	na
All institutions	121,521	2	2	58,755	3	2	17,233	4	3	8,282	-3	-2

1. Data for each year represent the summer term preceding the academic year plus the academic year. Full-time equivalent students are calculated by dividing undergraduate student credit hours by 30 and graduate student credit hours by 24.

2. Excludes medical school data.

a. Rounds to less than 1 percent.

b. Included in master's level.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1984 to 1989.

Table 3A

LINCOLN UNIVERSITY
 NUMBER AND PERCENTAGE DISTRIBUTION OF FULL-TIME EQUIVALENT STUDENTS¹
 BY ACADEMIC DIVISION AND LEVEL AND CIP CLASSIFICATION
 1988-89

CIP Classification	Total	Percent- age of total	Undergraduate			Percent- age of total	Graduate ²	Percent- age of total
			Lower division	Percent- age of total	Upper division			
Agriculture	--	--	--	--	--	--	--	--
Architecture and environmental design	--	--	--	--	--	--	--	--
Area and ethnic studies	--	--	--	--	--	--	--	--
Business	107	8%	40	4%	67	30%	--	--
Communications	--	--	--	--	--	--	--	--
Computer and information sciences	--	--	--	--	--	--	--	--
Consumer, personal and miscellaneous services	--	--	--	--	--	--	--	--
Education	213	16	181	20	32	14	--	--
Engineering	--	--	--	--	--	--	--	--
Foreign languages	68	5	58	7	10	4	--	--
Health	--	--	--	--	--	--	--	--
Home economics	--	--	--	--	--	--	--	--
Industrial arts	--	--	--	--	--	--	--	--
Law	--	--	--	--	--	--	--	--
Letters	170	13	157	18	13	6	--	--
Liberal/general studies	--	--	--	--	--	--	--	--
Library and archival sciences	--	--	--	--	--	--	--	--
Life sciences	74	6	64	7	10	4	--	--
Mathematics	151	11	141	16	10	4	--	--
Military sciences	--	--	--	--	--	--	--	--
Multi/interdisciplinary studies	5	a	5	1	--	--	--	--
Parks and recreation	--	--	--	--	--	--	--	--
Personal and social development	--	--	--	--	--	--	--	--
Philosophy, religion and theology	41	3	41	5	--	--	--	--
Physical sciences	92	7	72	8	20	9	--	--
Psychology	46	3	32	4	14	6	--	--
Public affairs and protective services	201	15	--	--	--	--	201	100%
Social sciences	148	11	100	11	48	21	--	--
Trade and industrial	--	--	--	--	--	--	--	--
Visual and performing arts	--	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--	--
Total ³	1,317	100	891	100	225	100	201	100

1. Data represent the summer term preceding the academic year plus the academic year. Full-time equivalent students are calculated by dividing undergraduate student credit hours by 30 and graduate student credit hours by 24.

2. Graduate includes master's level only.

3. Because of rounding, CIP detail may not sum to total.

a. Rounds to less than 1 percent.

SOURCE: Reports provided by Lincoln University, 1989.

Table 38

THE PENNSYLVANIA STATE UNIVERSITY
 NUMBER AND PERCENTAGE DISTRIBUTION OF FULL-TIME EQUIVALENT STUDENTS¹
 BY ACADEMIC DIVISION AND LEVEL AND CIP CLASSIFICATION
 1988-89

CIP Classification	Total	Undergraduate				Graduate ²	Percent- age of total	
		Percent- age of total	Lower division	Percent- age of total	Upper division			
Agriculture	715	1%	134	a	463	2%	118	2%
Architecture and environmental design	606	1	363	1%	236	1	7	a
Area and ethnic studies	223	a	125	a	84	a	14	a
Business	7,651	12	2,961	8	4,006	22	684	12
Communications	900	1	301	1	580	3	19	a
Computer and information sciences	1,458	2	1,115	3	199	1	144	2
Consumer, personal and miscellaneous services	--	--	--	--	--	--	--	--
Education	5,196	8	2,065	5	1,646	9	1,485	25
Engineering	5,467	9	1,478	4	2,855	15	1,134	19
Foreign languages	2,052	3	1,677	4	279	2	96	2
Health	613	1	228	1	363	2	22	a
Home economics	1,150	2	743	2	286	2	121	2
Industrial arts	--	--	--	--	--	--	--	--
Law	--	--	--	--	--	--	--	--
Letters	6,192	10	4,250	11	1,704	9	238	4
Liberal/general studies	72	a	50	a	22	a	--	--
Library and archival sciences	3	a	3	a	--	--	--	--
Life sciences	3,020	5	2,247	6	579	3	194	3
Mathematics	6,056	10	5,182	14	682	4	192	3
Military sciences	129	a	65	a	64	a	--	--
Multi/interdisciplinary studies	1,044	2	545	1	368	2	131	2
Parks and recreation	199	a	38	a	144	1	17	a
Personal and social development	--	--	--	--	--	--	--	--
Philosophy, religion and theology	808	1	672	2	99	1	37	1
Physical sciences	5,015	8	3,971	11	581	3	463	8
Psychology	1,881	3	1,329	4	408	2	144	2
Public affairs and protective services	964	2	204	1	535	3	225	4
Social sciences	7,247	12	5,005	13	1,984	11	258	4
Trade and industrial	342	1	342	1	--	--	--	--
Visual and performing arts	3,093	5	2,590	7	414	2	89	2
Other	--	--	--	--	--	--	--	--
Total ³	62,095	100	37,684	100	18,587	100	5,824	100

1. Data represent the summer term preceding the academic year plus the academic year. Full-time equivalent students are calculated by dividing undergraduate student credit hours by 30 and graduate student credit hours by 24.

2. Graduate includes master's and/or doctor's levels, and excludes medical school data.

3. Because of rounding, CIP detail may not sum to total.

a. Rounds to less than 1 percent.

SOURCE: Reports provided by The Pennsylvania State University, 1989.

Table 3C

UNIVERSITY OF PITTSBURGH
NUMBER AND PERCENTAGE DISTRIBUTION OF FULL-TIME EQUIVALENT STUDENTS¹
BY ACADEMIC DIVISION AND LEVEL AND CIP CLASSIFICATION
1988-89

CIP Classification	Total	Percent- age of total	Undergraduate		Percent- age of total	Graduate ²	Percent- age of total
			Lower division	Upper division			
Agriculture	--	--	--	--	--	--	--
Architecture and environmental design	--	--	--	--	--	--	--
Area and ethnic studies	203	1%	125	68	1%	10	a
Business	2,472	8	366	840	12	1,266	17%
Communications	61	a	3	32	a	26	a
Computer and information sciences	1,000	3	592	200	3	208	3
Consumer, personal and miscellaneous services	--	--	--	--	--	--	--
Education	1,846	6	295	500	7	1,051	14
Engineering	1,802	6	548	745	10	509	7
Foreign languages	961	3	754	148	2	59	1
Health	2,880	10	310	1,117	15	1,453	19
Home economics	106	a	--	74	1	32	a
Industrial arts	--	--	--	--	--	--	--
Law	818	3	--	--	--	818	11
Letters	3,268	11	2,094	971	13	203	3
Liberal/general studies	--	--	--	--	--	--	--
Library and archival sciences	153	1	--	2	a	151	2
Life sciences	856	3	588	189	3	79	1
Mathematics	1,804	6	1,520	196	3	88	1
Military sciences	18	a	13	5	a	--	--
Multi/interdisciplinary studies	262	1	145	100	1	17	a
Parks and recreation	--	--	--	--	--	--	--
Personal and social development	--	--	--	--	--	--	--
Philosophy, religion and theology	764	3	624	88	1	52	1
Physical sciences	2,260	8	1,792	137	2	331	4
Psychology	1,738	6	1,274	361	5	103	1
Public affairs and protective services	1,284	4	133	382	5	769	10
Social sciences	3,671	13	2,524	961	13	186	2
Trade and industrial	--	--	--	--	--	--	--
Visual and performing arts	1,050	4	825	176	2	49	1
Other	--	--	--	--	--	--	--
Total ³	29,271	100	14,526	7,288	100	7,457	100

1. Data represent the summer term preceding the academic year plus the academic year. Full-time equivalent students are calculated by dividing undergraduate student credit hours by 30 and graduate student credit hours by 24.

2. Graduate includes master's, first professional (excluding medical school) and/or doctor's levels.

3. Because of rounding, CIP detail may not sum to total.

a. Rounds to less than 1 percent.

SOURCE: Reports provided by University of Pittsburgh, 1989.

Table 3D

TEMPLE UNIVERSITY
NUMBER AND PERCENTAGE DISTRIBUTION OF FULL-TIME EQUIVALENT STUDENTS¹
BY ACADEMIC DIVISION AND LEVEL AND CIP CLASSIFICATION
1988-89

CIP Classification	Total	Percent- age of total	Undergraduate				Graduate ²	Percent- age of total
			Lower division	Percent- age of total	Upper division	Percent- age of total		
Agriculture	121	a	81	1%	39	a	1	a
Architecture and environmental design	--	--	--	--	--	--	--	--
Area and ethnic studies	171	1%	87	1	54	1%	30	1%
Business	3,932	15	1,118	10	2,207	23	607	10
Communications	1,146	4	477	4	551	6	118	2
Computer and information sciences	504	2	214	2	185	2	105	2
Consumer, personal and miscellaneous services	--	--	--	--	--	--	--	--
Education	3,108	12	958	9	864	9	1,286	22
Engineering	880	3	297	3	555	6	28	a
Foreign languages	769	3	473	4	251	3	45	1
Health	1,498	6	84	1	658	7	756	13
Home economics	--	--	--	--	--	--	--	--
Industrial arts	--	--	--	--	--	--	--	--
Law	1,307	5	3	a	4	a	1,300	22
Letters	2,014	8	1,315	12	563	6	136	2
Liberal/general studies	304	1	238	2	65	1	1	a
Library and archival sciences	--	--	--	--	--	--	--	--
Life sciences	800	3	234	2	395	4	171	3
Mathematics	1,390	5	1,079	10	247	3	64	1
Military sciences	9	a	5	a	4	a	--	--
Multi/interdisciplinary studies	4	a	3	a	1	a	b	a
Parks and recreation	176	1	66	1	82	1	28	a
Personal and social development	--	--	--	--	--	--	--	--
Philosophy, religion and theology	717	3	452	4	185	2	80	1
Physical sciences	940	4	555	5	293	3	92	2
Psychology	922	3	514	5	327	3	81	1
Public affairs and protective services	825	3	228	2	321	3	276	5
Social sciences	3,326	13	1,813	17	1,153	12	360	6
Trade and industrial	--	--	--	--	--	--	--	--
Visual and performing arts	1,587	6	691	6	628	7	268	5
Other	--	--	--	--	--	--	--	--
Total ³	26,453	100	10,983	100	9,631	100	5,839	100

1. Data represent the summer term preceding the academic year plus the academic year. Full-time equivalent students are calculated by dividing undergraduate student credit hours by 30 and graduate student credit hours by 24.

2. Graduate includes master's, first professional (excluding medical school) and/or doctor's levels.

3. Because of rounding, CIP detail may not sum to total.

a. Rounds to less than 1 percent.

b. Rounds to less than 1 full-time equivalent student.

SOURCE: Reports provided by Temple University, 1989.

Table 3E

STATE-OWNED UNIVERSITIES
NUMBER AND PERCENTAGE DISTRIBUTION OF FULL-TIME EQUIVALENT STUDENTS¹
BY ACADEMIC DIVISION AND LEVEL AND CIP CLASSIFICATION
1988-89

CIP Classification	Total	Percent- age of total	Undergraduate			Graduate ²	Percent- age of total	
			Lower division	Percent- age of total	Upper division			
Agriculture	11	a	3	a	8	a	b	a
Architecture and environmental design	5	a	3	a	2	a	b	a
Area and ethnic studies	116	a	77	a	33	a	6	a
Business	9,319	11%	3,996	7%	4,950	21%	373	6%
Communications	2,998	3	1,773	3	1,044	5	181	3
Computer and information sciences	1,814	2	1,413	2	286	1	115	2
Consumer, personal and miscellaneous services	--	--	--	--	--	--	--	--
Education	16,420	19	6,307	11	6,681	29	3,432	55
Engineering	262	a	82	a	154	1	26	a
Foreign languages	2,335	3	1,950	3	334	1	51	1
Health	1,418	2	344	1	857	4	217	4
Home economics	523	1	230	a	279	1	14	a
Industrial arts	178	a	146	a	25	a	7	a
Law	101	a	63	a	31	a	7	a
Letters	8,595	10	7,321	13	1,079	5	195	3
Liberal/general studies	188	a	183	a	5	a	--	--
Library and archival sciences	279	a	49	a	67	a	163	3
Life sciences	3,948	5	3,281	6	550	2	117	2
Mathematics	5,771	7	4,994	9	656	3	121	2
Military sciences	258	a	189	a	69	a	--	--
Multi/interdisciplinary studies	256	a	156	a	39	a	61	1
Parks and recreation	311	a	168	a	125	1	18	a
Personal and social development	444	1	315	1	121	1	8	a
Philosophy, religion and theology	1,637	2	1,448	3	168	1	21	a
Physical sciences	4,410	5	3,932	7	406	2	72	1
Psychology	4,998	6	3,336	6	1,170	5	492	8
Public affairs and protective services	1,143	1	596	1	505	2	42	1
Social sciences	13,254	15	10,540	18	2,422	11	292	5
Trade and industrial	23	a	6	a	17	a	--	--
Visual and performing arts	5,522	6	4,423	8	940	4	159	3
Other	116	a	114	a	2	a	--	--
Total ³	86,655	100	57,437	100	23,024	100	6,194	100

1. Data represent the summer term preceding the academic year plus the academic year. Full-time equivalent students are calculated by dividing undergraduate student credit hours by 30 and graduate student credit hours by 24.

2. Graduate includes master's level at all institutions except Lock Haven and doctor's level at Indiana.

3. Because of rounding, CIP detail may not sum to total.

a. Rounds to less than 1 percent.

b. Rounds to less than 1 full-time equivalent student.

SOURCE: Reports provided by the individual State-owned institutions, 1989.

Table 4
DEGREES CONFERRED¹
1988-89, CHANGE FROM 1987-88 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1983-84 to 1988-89)

Institution	Total				Bachelor's				Graduate ²			
	Degrees	One-year change	Percentage change One-year Five-year year average		Degrees	One-year change	Percentage change One-year Five-year year average		Degrees	One-year change	Percentage change One-year Five-year year average	
State-related												
Lincoln	241	-14	-5%	5%	166	10	6%	7%	75	-24	-24%	1%
Penn State	9,951	386	4	1	8,120	269	3	a	1,831	117	7	3
Pittsburgh	6,223	-46	-1	a	3,757	19	1	2	2,466	-65	-3	-2
Temple	5,324	352	7	2	3,437	261	8	3	1,887	91	5	a
Total	21,739	678	3	1	15,480	559	4	1	6,259	119	2	a
State-owned												
Bloomsburg	1,235	-95	-7	0	1,046	-114	-10	-1	189	19	11	5
California	949	36	4	6	774	7	1	5	175	29	20	12
Cheyney	144	-51	-26	-11	107	-65	-38	-12	37	14	61	12
Clarion	1,103	52	5	2	955	61	7	2	148	-9	-6	3
East Stroudsburg	820	64	8	1	691	47	7	1	129	17	15	2
Edinboro	1,043	136	15	2	895	76	9	3	148	60	68	-1
Indiana	2,561	47	2	-1	2,182	64	3	-1	379	-17	-4	2
Kutztown	1,125	117	12	4	1,001	93	10	4	124	24	24	3
Lock Haven	462	-6	-1	a	462	-6	-1	a	na	na	na	na
Mansfield	494	53	12	3	435	44	11	3	59	9	18	5
Millersville	1,164	-86	-7	a	1,045	-81	-7	a	119	-5	-4	1
Shippensburg	1,447	-70	-5	2	1,121	-52	-4	2	326	-18	-5	1
Slippery Rock	1,185	14	1	5	1,045	-24	-2	4	140	38	37	8
West Chester	1,573	113	8	3	1,319	68	5	2	254	45	22	3
Total	15,305	324	2	1	13,078	118	1	1	2,227	206	10	3
All institutions	37,044	1,002	3	1	28,558	677	2	1	8,486	325	4	1

1. Data for each year represent the summer term preceding the academic year plus the academic year.

2. Graduate includes master's at all institutions except Lock Haven, first professional (excluding medical schools) and doctor's at Pittsburgh and Temple, and doctor's at Penn State and Indiana.

a. Rounds to less than 1 percent.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1984 to 1989.

Table 5

WORKWEEK ACTIVITIES OF FULL-TIME EMPLOYED FACULTY BY TYPE OF ACTIVITY¹
1988-89, AND PERCENTAGE CHANGE FROM 1987-88

Institution	Full-time employed faculty ²		Average weekly hours ³											
	Number	Percentage change 1987-88 to 1988-89	Student contact				Instructional support	Percent-age change	Research	Percent-age change	Other university service	Percent-age change	Total work-week	Percent-age change
			Under-graduate	Percent-age change	Graduate	Percent-age change								
State-related														
Lincoln	68	0%	9.8	5%	1.4	75%	18.0	1%	10.4	-10%	11.2	-2%	50.8	0%
Penn State	2,894	3	6.8	-1	1.8	-5	19.8	0	12.0	3	11.4	1	51.8	a
Pittsburgh	1,643	1	4.4	-6	3.6	-5	15.6	-1	16.7	4	11.5	1	51.8	0
Temple	1,149	2	5.2	-9	3.1	-3	15.2	3	12.8	6	16.5	5	52.8	3
Total	5,754	2	5.8	-5	2.6	-4	17.7	1	13.5	3	12.5	2	52.1	1
State-owned														
Bloomsburg	338	0	11.4	10	.9	12	17.8	9	8.6	4	15.2	-10	53.9	2
California	279	-8	10.7	0	1.3	30	16.3	-4	7.6	4	18.3	-3	54.2	-1
Cheyney	99	-16	11.0	2	.6	-40	15.9	1	6.8	5	16.7	30	51.0	9
Clarion	336	3	10.4	0	.7	17	17.4	1	8.6	6	14.8	-5	51.9	a
East Stroudsburg	243	1	10.0	-1	.9	12	17.6	-3	10.4	8	16.0	-10	54.9	-3
Edinboro	326	8	12.9	4	.6	-14	18.9	-3	7.7	10	14.5	-2	54.6	1
Indiana	689	a	10.2	-4	1.1	-8	16.9	-4	10.3	-3	18.7	2	57.2	-2
Kutztown	347	14	12.6	8	.5	25	17.8	6	8.7	6	17.7	9	57.3	8
Lock Haven	171	-1	12.1	8	na	na	16.3	-2	7.2	-5	18.3	1	53.9	1
Mansfield	166	-4	10.3	7	.6	100	19.0	2	9.3	-7	18.8	14	58.0	5
Millersville	308	-2	10.8	-3	.6	0	15.6	-5	8.7	-3	16.9	2	52.6	-2
Shippensburg	310	-2	9.8	1	.9	-10	17.4	2	8.1	4	16.1	-3	52.3	a
Slippery Rock	350	1	11.6	4	.6	0	18.8	1	9.6	5	17.0	4	57.6	3
West Chester	445	7	10.7	3	1.4	8	18.9	-2	9.7	-1	19.9	-1	60.6	a
Total	4,407	2	11.0	2	.8	0	17.6	0	8.9	1	17.2	0	55.5	1
All institutions	10,161	2	8.0	0	1.8	-5	17.6	0	11.6	4	14.5	1	53.5	1

1. Instructional support includes course preparation and evaluation; other university service includes public service, institutional support and student services.

2. The number of full-time employed faculty for 1988-89 represents those reported by each institution for the fall term.

3. Average calculated using only those full-time employed faculty in the fall who reported a complete workweek of 100 hours or less.

a. Rounds to less than 1 percent.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1988 and 1989.

Table 6.

AVERAGE INSTRUCTIONAL SALARIES OF FULL-TIME EQUIVALENT INSTRUCTIONAL FACULTY AND PERCENTAGE DISTRIBUTION BY RANK¹
1988-89
(Dollars in thousands)

Institution	FTE instructional faculty		Average instructional salary		Professor		Associate professor		Assistant professor		Instructor		No rank ²	
	Number	Percentage change	Amount	Percentage change	Average instructional salary	Percent- age of faculty	Average instructional salary	Percent- age of faculty	Average instructional salary	Percent- age of faculty	Average instructional salary	Percent- age of faculty	Average instructional salary	Percent- age of faculty
		1987-88 to 1988-89		1987-88 to 1988-89										
State-related														
Lincoln	92	-1%	\$23.1	8%	\$34.3	12%	\$29.0	12%	\$23.2	39%	\$19.6	15%	\$15.9	22%
Penn State	3,356	2	33.3	7	54.5	15	40.3	17	32.5	26	22.6	19	24.0	23
Pittsburgh	1,731	-3	33.7	5	51.9	20	37.2	26	28.9	21	18.1	12	25.8	21
Temple	1,553	-1	30.4	3	45.0	26	35.7	21	30.6	14	17.6	16	17.6	23
Total	6,732	a	32.6	6	50.5	19	38.1	20	31.1	22	20.6	16	22.9	23
State-owned														
Bloomsburg	357	-1	35.3	8	44.9	27	37.2	30	29.1	32	23.6	11	na	0
California	290	4	35.7	-1	44.3	37	37.5	29	29.7	14	22.1	20	28.0	a
Cheyney	92	-18	41.0	9	51.7	33	37.3	48	34.9	12	25.1	7	39.0	a
Clarion	336	11	35.6	3	45.3	30	36.5	30	29.6	28	22.6	12	8.7	a
East Stroudsburg	265	2	35.2	7	42.5	40	34.0	28	28.0	23	24.8	9	14.5	a
Edinboro	361	12	36.9	6	45.4	42	35.9	24	28.5	26	22.2	8	35.4	a
Indiana	673	-3	36.1	9	45.3	34	36.5	28	29.7	28	23.2	9	17.6	1
Kutztown	338	1	37.9	6	46.7	29	38.8	34	31.4	31	24.6	6	41.5	a
Lock Haven	159	1	39.1	5	48.9	32	39.5	37	30.5	23	24.3	8	18.7	a
Mansfield	162	9	37.2	5	46.8	33	37.4	31	30.9	26	22.3	10	na	0
Millersville	348	a	36.2	6	44.8	33	37.6	31	29.6	26	20.5	10	na	0
Shippensburg	307	2	38.3	7	44.8	45	36.0	29	30.7	20	24.8	6	na	0
Slippery Rock	373	9	37.7	7	45.6	39	39.4	20	30.1	32	26.9	9	na	0
West Chester	521	6	36.5	10	47.1	27	38.5	33	30.3	26	21.8	14	52.0	a
Total	4,582	3	36.7	6	45.5	34	37.3	30	29.9	26	23.1	10	26.4	a
All institutions	11,314	1	34.3	6	47.8	25	37.7	24	30.6	24	21.3	14	22.9	13

1. Average instructional salaries are calculated by dividing the total instructional salaries paid to all staff members in the respective rank categories by their total full-time equivalency in the instructional function. One full-time equivalent faculty represents one full-time workload for two terms (one academic year). The summer term is treated as one term or one-half the academic year. Data for each year represent the summer term preceding the academic year plus the academic year.

2. The full-time equivalency of nonranked faculty members is based on the time spent in instruction by all nonranked personnel, including lecturers, administrators, librarians, research staff, graduate assistants and volunteers.

a. Rounds to less than 1 percent.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1988 and 1989.

Table 7

AVERAGE INSTRUCTIONAL FACULTY SALARY COST PER FULL-TIME EQUIVALENT STUDENT BY ACADEMIC DIVISION AND LEVEL¹
1988-89, CHANGE FROM 1987-88 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1983-84 to 1988-89)

Institution	Undergraduate						Master's					
	Lower division	Percentage change		Upper division	Percentage change		Total undergraduate	Percentage change		Total master's	Percentage change	
		One-year	Five-year average		One-year	Five-year average		One-year	Five-year average		One-year	Five-year average
State-related												
Lincoln	\$1,360	7%	3%	\$2,609	4%	2%	\$1,612	7%	3%	\$1,571	-3%	4%
Penn State	1,079	7	6	1,920	6	9	1,357	7	7	3,077	10	8
Pittsburgh	1,044	-2	4	2,025	2	4	1,372	-1	4	3,759	4	7
Temple	1,180	-3	2	1,638	-3	2	1,394	-3	1	2,657	-1	4
Total	1,092	3	5	1,870	3	6	1,371	3	5	3,232	4	7
State-owned												
Bloomsburg	1,508	5	5	2,621	11	6	1,831	7	5	2,191	-7	-3
California	1,345	-4	3	2,176	-9	a	1,610	-6	3	3,044	-1	-1
Cheyney	2,497	10	11	4,197	-3	8	2,862	6	10	4,297	17	a
Clarion	1,450	6	5	2,896	13	8	1,848	9	7	2,748	9	-4
East Stroudsburg	1,532	3	5	3,044	a	6	1,898	2	4	2,271	52	8
Edinboro	1,620	4	4	2,694	18	5	1,909	8	5	3,385	14	4
Indiana	1,303	10	8	2,549	10	7	1,700	9	7	4,084	-5	7
Kutztown	1,415	8	7	3,041	-2	8	1,929	4	7	2,640	7	2
Lock Haven	1,561	-5	1	3,498	10	6	2,099	1	3	na	na	na
Mansfield	1,390	9	6	4,157	13	9	2,082	8	7	2,844	-24	a
Millersville	1,432	2	5	2,749	-2	5	1,804	2	7	1,956	-10	a
Shippensburg	1,602	4	5	2,560	17	8	1,857	8	6	3,507	26	9
Slippery Rock	1,561	9	6	3,166	16	8	1,949	11	7	3,423	-1	5
West Chester	1,612	21	7	2,461	19	3	1,874	21	6	3,001	14	3
Total	1,495	6	5	2,771	8	6	1,860	7	6	2,980	5	2
All institutions	1,283	5	5	2,223	5	6	1,589	5	5	3,141	5	5

1. The average instructional faculty salary cost per full-time equivalent student for each level is calculated as follows: the instructional salary for each rank is assigned by level according to the percentage distribution of the course (assigned) credits within each rank. The salary determined by this method for each rank is summed by level and divided by the total full-time equivalent students at that level. In the case of individual instruction, one course (assigned) credit is attributed to every three student credit hours produced in individual instruction.

a. Rounds to less than 1 percent.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1984 to 1989.

Table 8A

LINCOLN UNIVERSITY
 AVERAGE INSTRUCTIONAL FACULTY SALARY COST PER FULL-TIME EQUIVALENT STUDENT¹
 BY ACADEMIC DIVISION AND LEVEL AND CIP CLASSIFICATION
 1988-89

CIP classification	Undergraduate			Graduate		
	Lower division	Upper division	Total undergraduate	Master's	First professional	Doctor's
Agriculture	--	--	--	--	--	--
Architecture and environmental design	--	--	--	--	--	--
Area and ethnic studies	--	--	--	--	--	--
Business	\$911	\$1,368	\$1,197	--	--	--
Communications	--	--	--	--	--	--
Computer and information sciences	--	--	--	--	--	--
Consumer, personal and miscellaneous services	--	--	--	--	--	--
Education	1,443	2,349	1,579	--	--	--
Engineering	--	--	--	--	--	--
Foreign languages	1,348	3,832	1,713	--	--	--
Health	--	--	--	--	--	--
Home economics	--	--	--	--	--	--
Industrial arts	--	--	--	--	--	--
Law	--	--	--	--	--	--
Letters	1,221	3,317	1,381	--	--	--
Liberal/general studies	--	--	--	--	--	--
Library and archival sciences	--	--	--	--	--	--
Life sciences	943	4,023	1,359	--	--	--
Mathematics	1,157	2,998	1,279	--	--	--
Military sciences	--	--	--	--	--	--
Multi/interdisciplinary studies	1,586	--	1,586	--	--	--
Parks and recreation	--	--	--	--	--	--
Personal and social development	--	--	--	--	--	--
Philosophy, religion and theology	1,536	--	1,536	--	--	--
Physical sciences	1,785	4,737	2,427	--	--	--
Psychology	1,113	2,166	1,434	--	--	--
Public affairs and protective services	--	--	--	\$1,571	--	--
Social sciences	1,856	2,991	2,224	--	--	--
Trade and industrial	--	--	--	--	--	--
Visual and performing arts	--	--	--	--	--	--
Other	--	--	--	--	--	--
Total	1,360	2,609	1,612	1,571	--	--

1. The average instructional faculty salary cost per full-time equivalent student for each level is calculated as follows: the instructional salary for each rank is assigned by level according to the percentage distribution of the course (assigned) credits within each rank. The salary determined by this method for each rank is summed by level and divided by the total full-time equivalent students at that level. In the case of individual instruction, one course (assigned) credit is attributed to every three student credit hours produced in individual instruction.

SOURCE: Reports provided by Lincoln University, 1989.

Table 8B

THE PENNSYLVANIA STATE UNIVERSITY
 AVERAGE INSTRUCTIONAL FACULTY SALARY COST PER FULL-TIME EQUIVALENT STUDENT¹
 BY ACADEMIC DIVISION AND LEVEL AND CIP CLASSIFICATION
 1988-89

CIP classification	Undergraduate			Graduate ²		
	Lower division	Upper division	Total undergraduate	Master's	First professional	Doctor's
Agriculture	\$1,809	\$2,271	\$2,167	\$5,648	--	\$10,028
Architecture and environmental design	946	3,515	1,958	39,549	--	15,889
Area and ethnic studies	1,253	2,418	1,721	4,283	--	20,937
Business	1,065	1,438	1,280	2,165	--	7,482
Communications	1,031	1,946	1,633	2,626	--	9,968
Computer and information sciences	1,507	2,250	1,619	2,128	--	12,500
Consumer, personal and miscellaneous services	--	--	--	--	--	--
Education	871	2,080	1,407	1,369	--	6,784
Engineering	2,579	2,115	2,274	4,355	--	10,942
Foreign languages	1,134	2,988	1,399	3,622	--	8,652
Health	1,322	2,892	2,286	6,131	--	10,077
Home economics	582	2,049	989	3,092	--	7,609
Industrial arts	--	--	--	--	--	--
Law	--	--	--	--	--	--
Letters	1,229	1,627	1,343	3,685	--	8,874
Liberal/general studies	718	1,842	1,061	--	--	--
Library and archival sciences	2,163	--	2,163	--	--	--
Life sciences	726	1,562	897	7,576	--	10,568
Mathematics	1,109	1,852	1,195	2,611	--	13,627
Military sciences	--	--	--	--	--	--
Multi/interdisciplinary studies	1,374	2,940	2,005	4,266	--	12,554
Parks and recreation	536	2,082	1,759	10,300	--	18,502
Personal and social development	--	--	--	--	--	--
Philosophy, religion and theology	978	2,309	1,149	6,723	--	14,144
Physical sciences	1,216	2,288	1,353	6,489	--	11,895
Psychology	525	1,749	813	4,172	--	8,166
Public affairs and protective services	1,021	2,423	2,036	2,196	--	9,352
Social sciences	741	1,494	955	4,143	--	11,612
Trade and industrial	2,253	--	2,253	--	--	--
Visual and performing arts	870	3,495	1,232	6,665	--	9,032
Other	--	--	--	--	--	--
Total	1,079	1,920	1,357	3,077	--	9,817

1. The average instructional faculty salary cost per full-time equivalent student for each level is calculated as follows: the instructional salary for each rank is assigned by level according to the percentage distribution of the course (assigned) credits within each rank. The salary determined by this method for each rank is summed by level and divided by the total full-time equivalent students at that level. In the case of individual instruction, one course (assigned) credit is attributed to every three student credit hours produced in individual instruction.

2. Excludes medical school data.

SOURCE: Reports provided by The Pennsylvania State University, 1989.

Table 8C

UNIVERSITY OF PITTSBURGH
 AVERAGE INSTRUCTIONAL FACULTY SALARY COST PER FULL-TIME EQUIVALENT STUDENT¹
 BY ACADEMIC DIVISION AND LEVEL AND CIP CLASSIFICATION
 1988-89

CIP classification	Undergraduate			Graduate ²		
	Lower division	Upper division	Total undergraduate	Master's	First professional	Doctor's
Agriculture	--	--	--	--	--	--
Architecture and environmental design	--	--	--	--	--	--
Area and ethnic studies	\$1,204	\$1,649	\$1,361	\$4,073	--	\$9,732
Business	1,227	1,404	1,350	1,272	--	14,285
Communications	557	1,663	1,568	967	--	--
Computer and information sciences	930	2,386	1,298	2,948	--	9,683
Consumer, personal and miscellaneous services	--	--	--	--	--	--
Education	1,161	2,537	2,026	2,363	--	6,121
Engineering	1,635	2,121	1,915	4,265	--	8,218
Foreign languages	1,564	3,033	1,805	5,163	--	8,962
Health	2,682	2,622	2,635	8,724	--	17,782
Home economics	--	1,684	1,684	4,416	--	--
Industrial arts	--	--	--	--	--	--
Law	--	--	--	--	\$1,584	--
Letters	1,168	1,317	1,215	4,728	--	7,531
Liberal/general studies	--	--	--	--	--	--
Library and archival sciences	--	4,536	4,536	2,493	--	9,061
Life sciences	1,002	2,287	1,315	6,861	--	9,553
Mathematics	1,092	2,526	1,256	3,945	--	13,995
Military sciences	--	--	--	--	--	--
Multi/interdisciplinary studies	971	1,692	1,265	4,394	--	6,414
Parks and recreation	--	--	--	--	--	--
Personal and social development	--	--	--	--	--	--
Philosophy, religion and theology	987	2,854	1,218	6,240	--	14,278
Physical sciences	846	3,521	1,036	4,506	--	6,695
Psychology	451	1,383	657	5,676	--	6,348
Public affairs and protective services	743	1,715	1,464	3,143	--	4,397
Social sciences	931	1,899	1,198	7,715	--	10,317
Trade and industrial	--	--	--	--	--	--
Visual and performing arts	941	2,791	1,266	6,721	--	10,595
Other	--	--	--	--	--	--
Total	1,044	2,025	1,372	3,759	1,584	8,168

1. The average instructional faculty salary cost per full-time equivalent student for each level is calculated as follows: the instructional salary for each rank is assigned by level according to the percentage distribution of the course (assigned) credits within each rank. The salary determined by this method for each rank is summed by level and divided by the total full-time equivalent students at that level. In the case of individual instruction, one course (assigned) credit is attributed to every three student credit hours produced in individual instruction.

2. Excludes full-time equivalent dental students, and medical school data.

SOURCE: Reports provided by University of Pittsburgh, 1989.

Table 8D

TEMPLE UNIVERSITY
 AVERAGE INSTRUCTIONAL FACULTY SALARY COST PER FULL-TIME EQUIVALENT STUDENT¹
 BY ACADEMIC DIVISION AND LEVEL AND CIP CLASSIFICATION
 1988-89

CIP classification	Undergraduate			Graduate ²		
	Lower division	Upper division	Total undergraduate	Master's	First professional	Doctor's
Agriculture	\$1,675	\$2,208	\$1,848	\$1,957	--	--
Architecture and environmental design	--	--	--	--	--	--
Area and ethnic studies	1,655	2,230	1,875	2,063	--	\$2,016
Business	1,002	1,262	1,175	2,022	--	6,905
Communications	926	1,716	1,349	3,344	--	5,503
Computer and information sciences	1,254	2,338	1,757	2,755	--	6,169
Consumer, personal and miscellaneous services	--	--	--	--	--	--
Education	957	1,540	1,233	1,741	--	4,068
Engineering	1,630	2,240	2,027	6,286	--	--
Foreign languages	1,258	1,692	1,408	2,751	\$2,568	8,459
Health	1,448	1,814	1,773	3,560	5,295	7,118
Home economics	--	--	--	--	--	--
Industrial arts	--	--	--	--	--	--
Law	6,522	4,892	5,591	2,793	1,978	--
Letters	1,252	1,557	1,343	3,653	--	4,972
Liberal/general studies	1,020	1,081	1,033	2,731	--	--
Library and archival sciences	--	--	--	--	--	--
Life sciences	559	603	586	4,750	1,011	6,367
Mathematics	1,271	2,013	1,409	3,703	--	5,550
Military sciences	--	--	--	--	--	--
Multi/interdisciplinary studies	420	1,560	705	1,500	--	--
Parks and recreation	1,133	1,114	1,122	2,559	--	5,064
Personal and social development	--	--	--	--	--	--
Philosophy, religion and theology	1,315	1,710	1,430	4,755	--	6,649
Physical sciences	1,198	1,566	1,325	4,889	--	8,293
Psychology	654	1,427	955	2,062	1,176	4,934
Public affairs and protective services	1,111	2,000	1,631	2,320	--	--
Social sciences	1,072	1,604	1,279	2,571	--	5,832
Trade and industrial	--	--	--	--	--	--
Visual and performing arts	2,109	2,687	2,385	5,106	--	8,058
Other	--	--	--	--	--	--
Total	1,180	1,638	1,394	2,657	2,869	5,205

1. The average instructional faculty salary cost per full-time equivalent student for each level is calculated as follows: the instructional salary for each rank is assigned by level according to the percentage distribution of the course (assigned) credits within each rank. The salary determined by this method for each rank is summed by level and divided by the total full-time equivalent students at that level. In the case of individual instruction, one course (assigned) credit is attributed to every three student credit hours produced in individual instruction.

2. Excludes medical school data.

SOURCE: Reports provided by Temple University, 1989.

Table 8E
STATE-OWNED UNIVERSITIES
AVERAGE INSTRUCTIONAL FACULTY SALARY COST PER FULL-TIME EQUIVALENT STUDENT¹
BY ACADEMIC DIVISION AND LEVEL AND CIP CLASSIFICATION
1988-89

CIP classification	Undergraduate			Graduate		
	Lower division	Upper division	Total under-graduate	Master's	First professional	Doctor's ²
Agriculture	\$2,577	\$2,942	\$2,843	\$10,208	--	--
Architecture and environmental design	2,770	1,979	2,453	6,111	--	--
Area and ethnic studies	1,425	2,329	1,696	6,591	--	--
Business	1,257	1,780	1,547	2,772	--	--
Communications	1,484	2,354	1,806	2,642	--	--
Computer and information sciences	1,514	3,376	1,828	2,386	--	--
Consumer, personal and miscellaneous services	--	--	--	--	--	--
Education	1,490	2,637	2,080	2,351	--	--
Engineering	2,137	2,871	2,616	1,232	--	--
Foreign languages	1,903	4,171	2,235	1,995	--	--
Health	2,408	4,149	3,651	4,453	--	--
Home economics	1,346	2,326	1,883	5,247	--	--
Industrial arts	3,252	6,157	3,677	7,786	--	--
Law	1,365	1,008	1,247	1,994	--	--
Letters	1,583	2,926	1,756	4,841	--	--
Liberal/general studies	459	573	462	--	--	--
Library and archival sciences	1,885	3,219	2,655	1,717	--	--
Life sciences	1,648	5,005	2,130	7,331	--	--
Mathematics	1,561	3,043	1,733	4,347	--	--
Military sciences	--	--	--	--	--	--
Multi/interdisciplinary studies	1,881	3,148	2,134	2,104	--	--
Parks and recreation	1,588	2,921	2,157	5,697	--	--
Personal and social development	1,749	2,582	1,981	2,917	--	--
Philosophy, religion and theology	1,328	2,718	1,472	4,486	--	--
Physical sciences	2,065	7,925	2,614	6,736	--	--
Psychology	1,091	2,360	1,421	2,667	--	--
Public affairs and protective services	1,342	2,282	1,773	2,987	--	--
Social sciences	1,206	2,733	1,491	4,322	--	--
Trade and industrial	1,926	4,452	3,793	--	--	--
Visual and performing arts	1,698	4,690	2,222	7,395	--	--
Other	1,581	1,026	1,572	--	--	--
Total	1,495	2,771	1,860	2,980	--	--

1. The average instructional faculty salary cost per full-time equivalent student for each level is calculated as follows: the instructional salary for each rank is assigned by level according to the percentage distribution of the course (assigned) credits within each rank. The salary determined by this method for each rank is summed by level and divided by the total full-time equivalent students at that level. In the case of individual instruction, one course (assigned) credit is attributed to every three student credit hours produced in individual instruction.

2. Doctor's at Indiana included in master's.

SOURCE: Reports provided by the individual State-owned institutions, 1989.

Table 9

AVERAGE CLASS SIZE IN CLASSROOM INSTRUCTION BY ACADEMIC DIVISION AND LEVEL¹
 1988-89, CHANGE FROM 1987-88 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1983-84 to 1988-89)

Institution	Undergraduate						Master's					
	Lower division			Upper division			Total undergraduate					
	Class size	Percentage change		Class size	Percentage change		Class size	Percentage change				
	One-year	Five-year average		One-year	Five-year average		One-year	Five-year average	Class size	One-year	Five-year average	
State-related												
Lincoln	21	0%	3%	12	9%	4%	18	0%	2%	14	8%	3%
Penn State	31	0	1	29	4	-1	30	0	0	15	0	7
Pittsburgh	33	3	3	27	0	2	31	3	3	18	0	1
Temple	26	4	0	24	4	2	25	4	1	13	0	0
Total	30	0	1	27	4	1	29	4	1	15	0	1
State-owned												
Bloomsburg	25	9	-1	17	6	-1	22	5	-1	14	17	5
California	31	7	2	19	6	4	26	4	2	12	20	10
Cheyney	19	-5	-3	11	10	-2	17	6	-2	13	62	12
Clarion	36	3	1	17	0	-1	28	4	0	13	0	9
East Stroudsburg	28	0	-1	16	0	-1	24	0	0	16	-16	1
Edinboro	27	0	2	16	-11	0	23	-4	1	9	-10	2
Indiana	31	0	0	17	0	0	25	0	0	8	14	0
Kutztown	29	-3	-2	16	14	-1	23	0	-2	14	8	5
Lock Haven	28	0	2	12	-29	-5	21	-12	-2	na	na	na
Mansfield	25	-11	-1	8	0	-4	16	0	-3	8	0	3
Millersville	25	0	-1	13	0	-1	20	0	-3	13	8	4
Shippensburg	32	14	4	23	10	2	29	12	3	13	8	0
Slippery Rock	30	3	0	15	0	0	24	4	0	13	30	4
West Chester	24	-4	-1	16	-6	1	21	-5	0	10	0	0
Total	28	0	0	16	0	0	23	0	0	11	0	2
All institutions	29	0	0	21	0	0	26	4	0	13	0	2

1. Average class size for each level is calculated by dividing total classroom student credit hours by total classroom course (assigned) credits.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1984 to 1989.

Table 10
TOTAL INSTRUCTIONAL COST PER FULL-TIME EQUIVALENT STUDENT
BY STATE^{1,2}
ALL PUBLICLY CONTROLLED INSTITUTIONS OF HIGHER EDUCATION
FISCAL YEAR 1988

State ³	Instructional cost per FTE student	Rank
Delaware	\$9,451	1
Alaska	8,930	2
Vermont	8,510	3
Maryland	8,407	4
Wyoming	8,256	5
New York	7,787	6
Arkansas	7,428	7
PENNSYLVANIA	7,397	8
Indiana	7,343	9
Michigan	7,246	10
Tennessee	7,238	11
Iowa	7,234	12
South Carolina	7,209	13
New Jersey	7,187	14
North Carolina	7,158	15
Ohio	7,129	16
Kentucky	7,042	17
Minnesota	6,994	18
Maine	6,992	19
Rhode Island	6,972	20
Connecticut	6,861	21
Idaho	6,720	22
Georgia	6,650	23
Washington	6,638	24
Wisconsin	6,559	25
Hawaii	6,507	26
Oregon	6,487	27
Virginia	6,414	28
Texas	6,413	29
Alabama	6,378	30
Mississippi	6,369	31
Colorado	6,363	32
Utah	6,307	33
California	6,304	34
North Dakota	6,272	35
South Dakota	6,215	36
Missouri	6,167	37
Kansas	6,127	38
New Hampshire	6,041	39
Montana	5,998	40
Florida	5,795	41
Arizona	5,704	42
Massachusetts	5,629	43
Nevada	5,600	44
Louisiana	5,523	45
New Mexico	5,498	46
Illinois	5,353	47
Nebraska	5,277	48
West Virginia	5,245	49
Oklahoma	4,815	50
U.S. average	6,602	

1. Direct instructional costs for each state include instruction, Student Services, and Scholarships and Fellowships. Allocatable costs include Libraries, Academic Support, Institutional Support, Plant Operation, Mandatory and Nonmandatory Transfers. The latter costs are allocated to instruction on the basis of the ratio of each state's direct instructional costs to its total costs, where total costs equal direct instructional costs plus direct noninstructional costs (Public Service and Research).

2. Based on preliminary data, which does not include imputed costs for nonreporting institutions; in fiscal year 1988, about one percent of the public universities did not report financial data in the IPEDS survey.

3. Arranged in descending order with regard to instructional cost per FTE student.

SOURCE: Instructional cost data provided by the National Data Service for Higher Education, Boulder, Co., January 1990; FTE students - Department of Education Statistics 1988, National Center for Education Statistics, Washington, D.C.

Table 11

ACADEMIC YEAR TUITION AND REQUIRED FEES FOR FULL-TIME STUDENTS BY ACADEMIC LEVEL AND RESIDENCE
1988-89, CHANGE FROM 1987-88 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1983-84 to 1988-89)

Institution	Undergraduate						Graduate ¹					
	In-State			Out-of-State			In-State			Out-of-State		
	Tuition and required fees	Percentage change		Tuition and required fees	Percentage change		Tuition and required fees	Percentage change		Tuition and required fees	Percentage change	
	One-year	Five-year average		One-year	Five-year average		One-year	Five-year average		One-year	Five-year average	
State-related												
Lincoln	\$2,400	13%	6%	\$3,500	12%	5%	\$3,250	30%	10%	\$4,850	21%	6%
Penn State ²	3,610	10	11	7,248	10	11	3,850	10	11	7,694	10	11
Pittsburgh ^{2,3}	3,836	10	10	7,516	10	10	4,632	10	11	9,162	10	11
Temple ³	3,894	9	8	6,802	9	7	4,298	9	8	5,378	9	8
Average	3,435	10	9	6,267	10	9	4,008	13	10	6,771	12	10
State-owned												
Bloomsburg	2,290	15	9	3,712	8	7	2,190	16	9	2,462	17	12
California	2,500	18	9	3,922	10	8	2,500	18	10	2,772	19	14
Cheyney	2,340	15	8	3,702	7	7	2,250	12	8	2,527	14	11
Clarion	2,358	16	9	3,780	9	7	2,304	16	9	2,576	17	12
East Stroudsburg	2,214	16	7	3,636	9	6	2,210	16	9	2,482	18	13
Edinborg	2,390	13	9	3,812	7	8	2,384	14	9	2,656	15	12
Indiana ²	2,269	10	7	3,691	6	7	2,231	13	8	2,503	14	11
Kutztown	2,322	15	9	3,744	8	8	2,202	16	10	2,474	17	13
Lock Haven	2,190	10	7	3,612	5	7	na	na	na	na	na	na
Mansfield	2,355	15	8	3,777	8	7	2,230	16	9	2,502	17	12
Millersville	2,350	15	9	3,772	9	8	2,234	16	10	2,506	17	13
Shippensburg	2,396	16	8	3,818	9	7	2,290	17	9	2,562	18	12
Slippery Rock	2,442	15	9	3,864	9	8	2,442	15	9	2,714	17	12
West Chester	2,250	13	8	3,672	7	7	2,250	19	10	2,522	20	14
Average	2,333	14	8	3,751	8	7	2,286	16	9	2,558	17	13

1. Graduate excludes first professional level.
 2. Main campus data only.
 3. Average cost for most programs; fees vary with programs.
- na. Not applicable.

SOURCE: Pennsylvania Department of Education, Basic Student Charges at Institutions of Higher Education, 1983-84 and 1987-88 and Colleges and Universities Basic Student Charges, 1988-89.

Table 12

TUITION AND FEE REVENUES RELATED TO FULL-TIME EQUIVALENT STUDENTS¹
 1988-89, CHANGE FROM 1987-88 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1983-84 to 1988-89)

Institution	Tuition and fee revenues			Tuition and fee revenues per FTE student			
	Amount (in millions)	Percentage One- year	Five-year average	Amount	One-year change	Percentage One- year	Five-year average
State-related							
Lincoln	\$4.1	15%	5%	\$3,140	\$400	15%	5%
Penn State	269.3	12	16	4,340	400	10	14
Pittsburgh	144.6	12	11	4,940	450	10	11
Temple	123.4	14	11	4,670	440	10	7
Total	541.4	13	13	4,540	410	10	11
State-owned							
Bloomsburg	15.4	12	12	2,260	240	12	9
California	13.0	20	19	2,170	210	11	11
Cheyney	3.4	-16	a	2,730	80	3	12
Clarion	14.7	21	17	2,340	290	14	13
East Stroudsburg	12.6	12	16	2,600	230	10	11
Edinboro	15.8	25	18	2,360	290	14	12
Indiana	32.2	17	14	2,440	350	17	14
Kutztown	16.1	16	16	2,460	260	12	10
Lock Haven	7.1	17	14	2,400	260	12	10
Mansfield	7.1	21	12	2,500	260	12	11
Millersville	16.9	20	14	2,450	320	15	11
Shippensburg	14.1	12	13	2,390	280	13	11
Slippery Rock	16.5	20	14	2,370	290	14	9
West Chester	24.4	16	17	2,550	420	20	12
Total	209.3	17	15	2,410	290	14	11
All institutions	750.7	14	13	3,650	370	11	11

1. FTE students include in-State and out-of-State undergraduate and graduate students.
 a. Rounds to less than 1 percent.

SOURCE: FTE students - reports provided by the individual institutions, 1984 to 1989; tuition and fee revenues - data provided by the individual State-related institutions, 1984 to 1989, and the State System of Higher Education, Commonwealth of Pennsylvania, 1984 to 1989.

Table 13

STATE APPROPRIATIONS FOR INSTRUCTION RELATED TO FULL-TIME EQUIVALENT STUDENTS¹
 1988-89, CHANGE FROM 1987-88 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1983-84 to 1988-89)

Institution	Appropriations			Appropriations per FTE student			
	Amount (in millions)	Percentage change One- year	Five-year average	Amount	One-year change	Percentage change One- year	Five-year average
State-related							
Lincoln ²	\$8.3	5%	16%	\$6,310	\$260	4%	16%
Penn State ³	150.6	5	7	2,430	80	3	6
Pittsburgh ³	104.0	5	7	3,550	130	4	7
Temple	113.1	5	8	4,270	90	2	4
Total	376.0	5	8	3,160	100	3	6
State-owned							
Bloomsburg	23.7	6	7	3,490	180	5	4
California	19.4	7	6	3,240	-30	-1	a
Cheyney	12.5	1	3	10,060	1,900	23	18
Clarion	21.7	5	6	3,450	-10	a	4
East Stroudsburg	17.3	4	6	3,600	70	2	2
Edinboro	21.7	3	6	3,260	-200	-6	2
Indiana	43.8	5	7	3,320	140	4	7
Kutztown	22.1	7	9	3,390	120	4	4
Lock Haven	13.0	4	6	4,390	-10	a	3
Mansfield	13.2	3	5	4,660	-280	-6	5
Millersville	23.6	6	7	3,410	20	1	5
Shippensburg	21.2	6	6	3,600	240	7	4
Slippery Rock	23.7	6	9	3,410	20	1	5
West Chester	31.9	7	8	3,330	310	10	5
Total ⁴	308.8	5	7	3,560	90	3	4
All institutions ⁴	684.8	5	7	3,330	100	3	5

1. Appropriations include funding for educational and general expenditures only.
2. Includes 1987-88 appropriation for desegregation.
3. Includes appropriation for Titusville campus.
4. Excludes amount of appropriation allocated to Board of Governors/Chancellor's Office and System Reserve.
 - a. Rounds to less than 1 percent.

SOURCE: FTE students - reports provided by the individual institutions, 1984 to 1989; appropriations - Governor's Executive Budget, 1985-86 and 1989-90 and data provided by the State System of Higher Education, Commonwealth of Pennsylvania, 1984 to 1989.

Table 14

TUITION AND FEE REVENUES, STATE APPROPRIATIONS AND STUDENT AID PER FULL-TIME EQUIVALENT STUDENT¹
 1988-89, CHANGE FROM 1987-88 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1983-84 to 1988-89)

Institution	Per FTE student			Ratio of Appropriations to total		Student aid per FTE student ²
	Tuition and fee revenues	State appropriations	Total	Percentage	Percentage change One-year Five-year average	
State-related						
Lincoln	\$3,140	\$6,310	\$9,450	67%	-3% 3%	\$224
Penn State	4,340	2,430	6,770	36	-3 -3	272
Pittsburgh	4,940	3,550	8,490	42	-2 -1	275
Temple	4,670	4,270	8,940	48	-4 -1	247
Total	4,540	3,160	7,700	41	-2 -2	267
State-owned						
Bloomsburg	2,260	3,490	5,750	61	-2 -1	175
California	2,170	3,240	5,410	60	-5 -3	253
Cheyney	2,730	10,060	12,790	79	5 1	281
Clarion	2,340	3,450	5,790	60	-5 -2	228
East Stroudsburg	2,600	3,600	6,200	58	-3 -2	113
Edinboro	2,360	3,260	5,620	58	-8 -3	208
Indiana	2,440	3,320	5,760	58	-3 -2	262
Kutztown	2,460	3,390	5,850	58	-3 -2	133
Lock Haven	2,400	4,390	6,790	65	-3 -2	195
Mansfield	2,500	4,660	7,160	65	-6 -1	226
Millersville	2,450	3,410	5,860	58	-5 -2	151
Shippensburg	2,390	3,600	5,990	60	-2 -2	166
Slippery Rock	2,370	3,410	5,780	59	-5 -1	243
West Chester	2,550	3,330	5,880	57	-3 -2	107
Total ³	2,410	3,560	5,970	60	-3 -2	193
All institutions ³	3,650	3,330	6,980	48	-4 -2	236

1. FTE students include in-State and out-of-State undergraduate and graduate students. Tuition and fees are based on revenues collected by the individual institutions. State appropriations include funding for educational and general expenditures only.

2. Includes grants and matching funds. Does not include student loans.

3. Appropriations exclude amount allocated to Board of Governors/Chancellor's Office and System Reserve.

SOURCE: FTE students - reports provided by the individual institutions, 1984 to 1989; tuition and fee revenues - data provided by the individual State-related institutions, 1984 to 1989, and the State System of Higher Education, Commonwealth of Pennsylvania, 1984 to 1989; appropriations - Governor's Executive Budget, 1985-86 and 1989-90, and data provided by the State System of Higher Education, Commonwealth of Pennsylvania, 1984 to 1989; student aid - data provided by the Pennsylvania Higher Education Assistance Agency, October 1989.

Table 15

TUITION REVENUE, STATE AND LOCAL APPROPRIATIONS PER FULL-TIME EQUIVALENT STUDENT
BY STATE^{1,2}
ALL PUBLICLY CONTROLLED INSTITUTIONS OF HIGHER EDUCATION
FISCAL YEAR 1988

State	Per FTE student			Percentage of appropriations to total	Rank
	Tuition revenue	State and local appropriations	Total		
Wyoming	\$871	\$6,791	\$7,662	89%	1
Alaska	1,307	9,432	10,739	88	2
Hawaii	1,013	7,150	8,163	88	3
North Carolina	970	6,423	7,393	87	4
California	850	5,152	6,002	86	5
Massachusetts	955	4,588	5,543	83	6
Florida	1,169	5,093	6,262	81	7
Texas	1,208	5,037	6,245	81	8
New Mexico	1,076	4,459	5,535	81	9
Idaho	1,363	5,340	6,703	80	10
Nevada	1,091	4,265	5,356	80	11
Oklahoma	933	3,625	4,558	80	12
New York	1,530	5,783	7,313	79	13
West Virginia	1,132	4,089	5,221	78	14
Georgia	1,602	5,773	7,375	78	15
Arkansas	1,448	5,168	6,616	78	16
Kentucky	1,637	5,534	7,171	77	17
Tennessee	1,584	5,269	6,853	77	18
Montana	1,198	3,868	5,066	76	19
Utah	1,490	4,663	6,153	76	20
Kansas	1,498	4,677	6,175	76	21
Alabama	1,570	4,695	6,265	75	22
Nebraska	1,340	3,954	5,294	75	23
Oregon	1,563	4,515	6,078	74	24
Connecticut	1,666	4,796	6,462	74	25
Washington	1,496	4,293	5,789	74	26
New Jersey	1,845	5,200	7,045	74	27
Mississippi	1,512	4,253	5,765	74	28
South Carolina	1,980	5,558	7,538	74	29
Illinois	1,353	3,707	5,060	73	30
Arizona	1,588	4,287	5,875	73	31
Minnesota	1,825	4,582	6,407	72	32
Wisconsin	1,906	4,747	6,653	71	33
Louisiana	1,623	3,975	5,598	71	34
North Dakota	1,619	3,939	5,558	71	35
Maryland	2,053	4,935	6,988	71	36
Iowa	2,002	4,732	6,734	70	37
Missouri	1,774	3,970	5,744	69	38
Virginia	1,998	4,219	6,217	68	39
Rhode Island	2,157	4,545	6,702	68	40
Indiana	2,390	4,685	7,075	66	41
Michigan	2,330	4,308	6,638	65	42
South Dakota	2,036	3,569	5,605	64	43
Ohio	2,501	3,994	6,495	61	44
Colorado	2,401	3,088	5,489	56	45
Delaware	3,776	4,330	8,106	53	46
PENNSYLVANIA	3,242	3,658	6,900	53	47
New Hampshire	3,421	2,648	6,069	44	48
Maine	1,775	883	2,658	33	49
Vermont	5,337	2,399	7,736	31	50
U.S. average	1,605	4,719	6,324	75	

1. Arranged in descending order with regard to percentage of appropriations to total.

2. Based on preliminary data, which does not include imputed revenues for nonreporting institutions; in fiscal year 1988, about one percent of the public universities did not report financial data in the IPEDS survey.

SOURCE: Tuition Revenue and State and Local Appropriations data provided by the National Data Service for Higher Education, Boulder, Co., January 1990; FTE Students - Department of Education Statistics 1988, National Center for Education Statistics, Washington, D.C.

