

PROJECT IN RESEARCH IN UNIVERSITIES

University Unit Costs

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Foreword

THIS BULLETIN is one of a series reporting the findings of investigations undertaken during 1936-37 under the Project in Research in Universities of the Office of Education. The project was financed under the Emergency Relief Appropriation Act of 1935, and conducted in accordance with administrative regulations of the Works Progress Administration. Study findings in addition to those reported in this bulletin will be made available in other Office of Education or institutional publications.

The Project in Research in Universities represents a unique and significant innovation in cooperative research. Sixty universities and cooperative institutions located in 32 States, the District of Columbia, and Hawaii combined efforts with the Office of Education to conduct 40 studies, 23 of which were proposed by the Office and 17 by the institutions. Each institution was invited to participate in all of the approved studies that it was in a position to undertake. From 1 to 14 studies were conducted in each institution, and a total of more than 150 separate reports were made to the Office of Education.

An important feature of the project was the widespread and coordinated attack on each problem by a number of universities at the same time. Each study proposed by the Office of Education and accepted by the universities was conducted by two or more institutions. As many as 31 institutions, located in 20 States representative of each major geographical division of the country, participated in one study alone. The task of planning, administering, and supervising the many projects and studies on a national scale, under complex and often difficult conditions, demanded the finest type of cooperative endeavor. Except two places where qualified relief workers could not be found or retained, every institution which actually began work on the project carried it through to successful completion. The fine professional spirit in which responsibility for the work was accepted and maintained by the institution made possible the successful completion of the project within approximately 1 year.

With this professional spirit of cooperation in worth-while research and study of educational problems was manifested a strong humanitarian desire to join hands with Federal agencies striving during the years of the depression to afford gainful and socially desirable employment to college graduates.

or former students in the type of work for which they were best prepared. For these contributions to educational research and to the social good of the Nation, the Office of Education extends to its colleagues and helpers in the universities of the country its grateful acknowledgment and appreciation.

This bulletin comprises one of the studies proposed by the Office of Education. Nine universities participated. It consists of an analysis of the unit costs of instruction in each university. Such costs have been recognized as of particular value in the internal educational administration and financial management of universities and colleges. The computation of unit costs, however, had almost always been regarded as an intricate task, especially in institutions with a variety of functions, services, and activities. In the past, different units have been frequently used as a basis for computing the costs and different procedures followed in distributing the expenditures. The present study provided for the employment of the same unit by the participating universities. In addition, a uniform procedure was followed by all of them.

It is hoped that this publication will prove valuable in clarifying the methods of conducting unit cost analyses and in encouraging universities and colleges to undertake them in the future.

BESS GOODYKOONTZ,
Assistant Commissioner.

University Unit Costs

Chapter I

Introduction

THE FINANCIAL management and educational administration of universities and colleges are closely interwoven. Upon the efficient direction of the financial affairs depends in no small measure the efficacy of the educational program. For this reason any device affording an opportunity for a more detailed appraisal of the finances of the institutions should prove beneficial to governing boards, executive and administrative officers responsible for their administration.

Unit costs of the operation of universities and colleges are believed to be of special advantage in this respect. In the first place, figures showing unit costs present a more adequate picture of the actual financial status of the institution than the mere itemization of expenditures. Secondly, it is possible to ascertain the difference in costs on a unit basis of conducting the various courses of study, departments, colleges, or schools and other divisions including the entire institution. Thirdly, through analyzing the unit costs adjustments may be made in the educational and business administration resulting in economies and savings. A fourth important advantage is the utilization of the figures in the preparation of the annual budget which provides for the distribution of expenditures among the various activities of the institution.

Computation of unit costs for a small college, the functions of which are devoted exclusively to the instruction of students, is not an exceedingly difficult undertaking. In the case of the large universities, a different situation exists. Such institutions have a complex organization. Their functions include manifold activities. In addition to the instruction of students, research into new fields of knowledge is conducted, frequently on a large scale. Extension work of various types is maintained off the campus, especially by State-controlled institutions. A variety of other services is rendered to the general public. The computation of unit costs for these institutions thus becomes a complicated procedure.

Purpose of bulletin.—The purpose of this bulletin is twofold. It is proposed (1) to illustrate the use of a standard procedure for the determination of unit costs in 9 large universities conducting a variety of functions and (2) to give the unit costs of instruction of certain of their services as computed by this procedure. Since the greatest value of obtaining unit costs is to furnish information for the improvement of internal operation and administration

of an institution, it is not the intention of this bulletin to compare the figures for the different universities. Although the compilations and charts have been so arranged that a comparison of the unit costs of one university may be made with those of another university, the primary object is to enable comparisons of the unit costs of the several functions within the same university. An important reason for not comparing unit costs among the individual universities is that they are dissimilar in organization and vary in the number of services performed by them. Moreover, each university has its own specific educational aims or objectives differing from those of the other.

Standard procedure and year for which costs were computed.—The standard procedure for computing unit costs employed in the bulletin consisted of a system developed by the National Committee on Standard Reports for Institutions of Higher Education. Under the committee's system was outlined a detailed and complete method of assembling and classifying the required data on student enrollments and financial expenditures. A full description was likewise given of the necessary steps for allocating and distributing the expenditures to the several divisions of the institution. In addition, the committee provided 64 blank forms. By filling in these forms it was possible for the universities to follow each successive step in the compilation of the data and the computation of the unit costs.¹ The unit costs were computed for the fiscal year of 1934-35 in all the universities excepting one. In the case of the latter university the figures were for the fiscal year of 1935-36 due to the fact that the institution had undergone a reorganization during the preceding year.

Universities participating in study.—The nine universities cooperating with the Office of Education in prosecuting this study included institutions of several types and classes. Three were State universities and one was a State college of agriculture and mechanic arts. Two were municipal universities. The remaining universities were privately controlled. All of the institutions conducted regular university educational programs with the exception of one which was a polytechnic institute. Of the nine universities there were five which were located in large urban communities while the others were situated in fairly small communities or in the open country. The identity of none of the universities is revealed throughout this bulletin. Each is designated by one of a series of letters ranging from "A" to "I" rather than by name.

Scope of study.—The various activities conducted by the nine universities were both educational and noneducational in character. The educational activities consisted of instruction of students, scientific research, off-campus extension, short courses, institutes, lectures, public services of various types, and the like. Noneducational activities included testing, regulatory, inspectional, and supplementary services, particularly in the case of State univer-

¹ National Committee on Standard Reports for Institutions of Higher Education. *Financial Reports of Colleges and Universities, Appendices A and B.* pp. 177-270. Chicago, Ill., The University of Chicago Press, 1935.

sities and colleges. Of the other noneducational activities applicable to all institutions was the operation of dormitories, dwellings, dining halls, cafeterias, laundries, and similar auxiliary enterprises.

The computation of unit costs made in this study was limited only to instruction of students by department, college, or school; level of academic work; curriculum; and for the institution as a whole, covering the regular academic term in each of the nine universities. There were two universities which in addition computed the unit costs of instruction for their extension work and summer session. No attempt was made by any of the universities to compute the unit costs for other types of educational activities nor for any of the noneducational activities.

Presentation of material and source of data.—In the determination of unit costs of an institution two main factors are involved: The particular unit used and the items of expenditure for the various functions.² The unit employed in the present study was the student-credit-hour. In presenting the material it is first planned to explain the method followed in compiling the student enrollments and student-credit-hours. Figures showing the student-credit-hours for the several departments and colleges or schools within each university will then be given.

Next will be outlined the procedure by which the instructional costs including teaching and overhead were obtained. This procedure necessitated the segregation of expenditures by department and by college or school for teaching, covering such items as salaries, teaching supplies, and departmental administration. A further step included the allocation of each department's share of the expenditures for college or school administration. From these basic figures the unit costs of teaching by department and college or school will be given. In the same manner the plan pursued in compiling the overhead expenditures including the distribution of such expenditures for general institutional administration, library, and operation and maintenance of the physical plant to the several departments and colleges or schools will be explained. On a basis of the resultant figures the unit overhead costs will be shown and finally the total unit instructional costs.

In the presentation of the unit costs for the different levels of academic work, a somewhat similar plan will be followed. First will be shown the procedure employed by the universities in compiling the student-credit-hours and instructional expenditures for the junior college, senior college, and graduate levels. The unit costs for each level by department, by college or school, and for the institution as a whole will then be given. With respect to curriculums, the method employed in tabulating the number of units and the expenditures will likewise be explained. Unit cost figures

² For detailed information and bibliography on other unit-cost studies, including the use of different units and procedures for the distribution of expenditures, see *A Study of Methods Used in Unit-Cost Studies in Higher Education*, Bulletin No. 3, National Committee on Standard Reports for Institutions of Higher Education, July 1932, published by the Committee. (A copy of this publication should be available in university libraries, the original supply in the hands of the committee being exhausted.)

will then be presented for sample curriculums leading to the bachelor's degree with majors in the various fields.

The sources of data for all phases of this unit cost study were the regular student records and financial accounts of the universities.

Caution in interpreting unit costs.—It must be emphasized that the unit costs should be interpreted with caution. Many imponderable elements not susceptible to arithmetic measurement enter into the instruction of students. Frequently the unit cost of instruction for one department is shown to exceed greatly that of another department. A similar disparity in the unit cost figures of colleges or schools is found. Such differences should not be assumed as a justification for arbitrarily reducing expenditures of the department and college or school with the higher unit costs. Before such steps are taken a meticulous analysis of all the elements involved in their relationship to the general educational program of the institution is essential.³

³ The following references will be found of special value in explaining the interpretation of unit costs:
Coffman, L. D.; Hill, Clyde M.; Kelly, F. J.; Zook, George F.; and Works, George A. Texas Educational Survey Report. Vol. VI. Higher Education, p. 38. Austin, Texas Educational Survey Commission, 1925.
Reeves, Floyd W., and Russell, John D. Nation's Schools, Vol. VI, pp. 30-31, 34-36, October 1929.
Morey, Lloyd. Determining the unit expense of instruction. Conclusion. In University and College Accounting. Chap. X, p. 184. New York, John Wiley and Sons, Inc., 1930.

Chapter II

Units for Computing Costs

AS THE number of units constitutes one of the principal measurements involved in determining instructional costs of departments and colleges or schools, the initial step taken by the universities was to ascertain the student-credit-hours represented in each of them covering the year.

For the purpose of this study, a student-credit-hour consisted of one student under instruction for a period for which 1 hour of credit was allowed.¹ In order to calculate the number of student-credit-hours, therefore, it was necessary to take into consideration both the number of students registered and the number of hours of credit allowed.

Student-credit-hours by department and by college or school.—The procedure followed by the universities was to list the various courses of study offered in resident instruction within a department. The number of students registered in each course both for the first and second semesters of the year was then recorded.² As is readily comprehended, it was not possible to use the actual number of students originally registering for the course. Some of these students dropped the courses almost immediately, cancelling their registration. Others remained in the course for only a brief period.

Two alternative methods were used in obtaining the figures showing the number of students continuously or actively enrolled in the course. Under the first, a census was taken of the students in the course at the end of the third week of each semester. The second arrangement provided for a tabulation of the attendance of students through weekly reports during the semesters from which a mean or average number of students pursuing the course was obtained. Practically all these data were already available in the registrars' offices of the universities.

Having ascertained the number of students actively registered in the course it was necessary next to record the number of hours for which credit was given in the course or its credit-hour value. For example, in course 101 in the department of botany, 4 hours of credit were given for the first semester. Assuming that the number of students registered in the course was 25, the

¹ National Committee on Standard Reports for Institutions of Higher Education. *Financial Reports of Colleges and Universities Appendix A*, p. 178, Chicago, Ill., The University of Chicago Press, 1935.

² One of the nine universities operated on the quarter instead of the semester system so that in this case the number of students registered in each course for the three quarters had to be shown, the figures later being converted to a semester basis.

number of student-credit-hours for the course would be 100, this figure being obtained by multiplying the hours of credit by the number of students registered. For the same course continued for the second semester, the number of student-credit-hours would again be 100, making 200 student-credit-hours for the course on the full-year basis.

After calculating the number of student-credit-hours according to this procedure for each course covering both semesters within a department, the results were added together giving the total student-credit-hours for the department. Such figures were obtained for each of the departments of instruction. The student-credit-hours for each college or school were secured by summing the student-credit-hours for the several departments constituting the college or school.

In the universities in which duplicate registrations of students occurred within departments and colleges or schools, it was necessary to deduct the duplicates in order to obtain the net total of students registering.

TABLE 1.—Number of units for computing costs by department and by college or school in 9 universities

Department and college or school	Number of student-credit-hours in—								
	Uni- versity	Uni- versity	Uni- versity	Uni- versity	Uni- versity	Uni- versity	Uni- versity	Uni- versity	Uni- versity
	A	B	C	D	E	F	G	H	I
1	2	3	4	5	6	7	8	9	10
Department of:									
Botany.....	5,311		1,591			2,242	1,201		
Chemistry.....	15,142	9,620	4,356	3,945	2,365		2,805	13,070	2,479
Classical languages.....			1,259	1,403	1,193	1,300	124	515	
English.....	13,925	3,158	12,622	3,459	3,303	21,400	9,442	19,624	2,996
Foreign languages.....	2,871	1,272	6,811	3,014	2,882	8,035	3,273	8,150	2,941
History.....	4,484	1,795	4,959	4,061	3,126	6,818	1,816	10,663	4,287
Home economics.....				1,560	615			762	2,412
Mathematics.....	7,651	4,592	2,787	3,024	2,213	5,922	3,206	5,620	3,191
Music.....	2,723		2,929		275		965		2,149
Philosophy.....			3,051	1,303	423	2,683		827	1,225
Physics.....	2,058	4,169	2,027	1,003	2,390	3,967	965	8,746	902
Political science.....			6,478		1,033		2,558	7,494	1,587
Physical education.....	2,891		5,798	2,949	885		1,627		911
Psychology.....			5,844	3,204	1,844	4,839	3,217	3,391	1,392
Zoology.....	2,886		2,735			3,642	1,513		
Civil engineering.....	3,356	2,685	1,237	3,037		1,172	1,373	283	407
Electrical engineering.....	1,275	1,040	1,202	2,313		1,858	539	616	169
Mechanical engineering.....	2,782	7,826	2,740	2,926		2,288	1,272	986	797
College or school of:									
Arts and sciences.....	63,755		68,485	54,899	28,369	65,714	44,166	126,527	32,908
Agriculture.....	10,818		130				5,952		
Commerce and business.....	15,454		12,836	4,206	6,700	57,871			6,523
Education.....	7,909		10,919		1,529	6,090	8,501	10,529	2,476
Engineering.....	11,942	141,725	8,907	17,099	662	13,248	3,184	7,173	2,413
Law.....			2,375	2,307	3,307		1,528		1,383
Pharmacy.....				1,653	803			1,983	

In table 1 are given the number of units as represented by student-credit-hours for selected departments and colleges or schools in the nine universities. Special attention must be called to the fact that the departments and colleges or schools in the table do not comprise all those conducted by the

universities. On account of the difference in educational organizations and in nomenclature utilized for designating departments and colleges or schools, it was impossible to show each of them for every university except by a lengthy and involved compilation. As a consequence, certain ones having the same names and apparently comprising the same subject-matter fields with several exceptions were selected. In each instance the department and college or school included in the table were found in three or more universities. These same departments and colleges or schools are used in the subsequent tables of this bulletin showing expenditures and unit costs for various branches of the institutions.³

It must be noted that the figures in the table for some departments represented two combined fields in certain universities. The department of English in University A included also journalism so that the number of student-credit-hours given in the table is for the department of English and journalism in this particular university rather than the department of English. Similarly, history and economics were combined in University A under a department of history and economics. In University B the department of history included political science, the figures in the table being for the department of history and political science instead of history. Civil engineering and architecture were combined into the single department of civil engineering and architecture in University D. The student-credit-hours given in the table for the department of civil engineering in the case of this university should be interpreted accordingly. In the same institution mechanical and chemical engineering were combined into the department of mechanical and chemical engineering. In University E the student-credit-hours shown in the table for the department of physics represent those for the department of physics and astronomy.

Two universities, E and F, maintained separate departments of Latin and Greek rather than a single department of classical languages. For the convenience of this study, the student-credit-hours for these two separate departments were added together and the total given under the department of classical languages in the table. Separate departments of French, Spanish, and Italian were likewise conducted by University H. The total student-credit-hours for the three departments were recorded under the department of foreign languages.

It will be noticed that of the colleges or schools listed in the table the school of medicine has been omitted. Three of the participating universities operated medical schools. While no particular difficulty was encountered in obtaining representative figures showing the student-credit-hours for the medical schools to be included in this table, other basic data necessary for the computation of unit costs for the medical schools were not regarded as entirely accurate. For example, in one university two hospitals were operated as adjuncts to its medical school. Since these hospitals were devoted both to public service and to instruction of students in the

³ The data on this unit-cost study are being preserved intact so that anyone desiring to obtain figures on the unit costs of any department and college or school not included in the tables may do so by communicating with the Office of Education.

medical school, it was found impossible to segregate the expenditures for the two purposes except by arbitrary estimates.

In the medical school of the third university, a large proportion of the faculty consisted of part-time teachers serving without pay. To obtain the expenditures for teaching salaries, estimates had to be made of the compensation which these particular teachers would have received had they actually been paid salaries for their teaching out of the treasury of the institution. Since these figures were based largely on subjective estimates, it was believed unit costs computed on them were not of sufficient reliability to warrant their inclusion in the bulletin.

Chapter III

Instructional Costs .

HAVING SECURED the number of student-credit-hours or units for each department and college or school, the next step taken by the universities was to obtain the instructional costs.

The two main items of instructional costs¹ were teaching costs and overhead costs, each of which was subdivided into a number of items. The procedure followed by the universities consisted of securing the amounts of the expenditures for each of these classifications segregated by department and by college or school.

TEACHING COSTS

Teaching expenditures included teaching salaries, teaching supplies, departmental administration, and college or school administration. One of the first requirements in securing the expenditures for these different items was the distribution of the salaries of the members of the faculty. In general, the work performed by the faculty members comprised teaching, departmental administration, college or school administration, research, and public services. It was necessary, therefore, to ascertain the percentage of time devoted by every faculty member to each of these functions. With this information at hand, the percentage shown as being devoted to the several functions was then used for calculating the amount of the faculty member's salary that should be charged to the expenditures for each of them.

Three plans were utilized to accomplish this object. Under the first the regular distribution of time authorized or approved by the institutional administrative officers was used in the universities in which such a practice existed. The second plan provided for the submission of a blank form to each member of the faculty to be filled in showing the percentage of time devoted to each of the functions. A third plan adopted by one university was based on an arbitrary distribution. Faculty members who taught as much as 15 hours were assumed to have devoted full time, or 100 percent, to teaching.

¹ Attention is called to the fact that *instructional posts* as used here include *overhead costs*, which are made up of the prorated part of expenditures for *administration, libraries, and operation and maintenance of plant*, as indicated on page 182, table II, Financial Reports for Colleges and Universities. These latter items are not included in the accounting classification designated as *instruction*, on page 45 of the publication cited, which consists of teaching salaries, supplies, and expenses only.

The other functions, such as departmental administration, college or school administration, research, and public services, were regarded as donated to the university. In the case of faculty members who taught less than 15 hours, the time not devoted to teaching was distributed among the other functions performed by them on a percentage basis.

Expenditures for teaching salaries by department and by college or school.—The expenditures for teaching salaries of each department were secured by listing the faculty members within each department and totalling the amount of the salary of each of them charged to teaching on a basis of one of the foregoing plans. In case a faculty member taught in more than one department his salary was prorated among the departments to which his services were rendered. The expenditures for teaching salaries of each college or school were obtained by totalling the figures for the departments included in the particular college or school.

Expenditures for teaching supplies by department and by college or school.—Teaching supplies included all materials and equipment replacement used in actual classroom and laboratory teaching. The expenditures of each department for such purposes were secured by adding together the specific amounts charged directly to the department representing purchases made over the year. Expenditures of each college or school for teaching supplies consisted of the total of the expenditures of the departments comprising the college or school plus any additional expenditures for teaching supplies for the general use of the college or school.

Expenditures for departmental administration.—The distribution of the time of the faculty members formed the basis of the expenditures for departmental administration. To obtain this figure for each department it was necessary to total the proportionate amounts of the salaries of all faculty members within the department charged to departmental administration. One of the large items was the salary of the head of the department, the greater part of which was charged to departmental administration. Other items included wages for stenographic and clerical help and office supplies. The expenditures covering departmental administration for the several colleges or schools consisted of the total of such expenditures for the various departments in each of them.

Department's allocated share of college or school administration.—In addition to other teaching expenditures, each department was charged with its allocated share of the expense of administering the college or school of which it was a part. The amount of this share was obtained by two pro-rating factors. One was known as the budgetary pro-rating factor which was secured by dividing the total expenditures for administration of the college or school by its total budgetary expenditures. This factor, therefore, represented the percentage that the total expenditures for administration were of the total budgetary expenditures of the college or school. The other, known as the student-credit-hour pro-rating factor, was obtained by dividing the total expenditures for administration by the total number of student-credit-hours

for the college or school. The latter factor consisted of the average cost for administration per student-credit-hour of the college or school.

The budgetary expenditures for each department were multiplied by the budgetary pro-rating factor and the student-credit-hours for the department by the student-credit-hour pro-rating factor. The two products were then added together and divided by two, giving the amount to be charged to each department as its allocated share of the administration of the college or school to which it belonged.² Included in the expenditures for college and school administration for the several colleges and schools were that portion of the dean's salary allocated to administration, the wages of the assistants and clerical force in his office, the proportionate parts of the salaries of faculty members within the college or school charged to administration as indicated by the original salary or time distribution, and other incidental expenses.

Table 2 presents a compilation of the amounts of teaching expenditures for the several classifications by department and by college or school in University A. The other eight universities followed this same plan in compiling such expenditures. In the last column of the table are given the total departmental teaching expenditures for each department and the total college or school teaching expenditures for each college or school.

TABLE 2.—Amounts of teaching expenditures for salaries, supplies, departmental and college or school administration by department and by college or school in University A

Department and college or school	Teaching salaries	Teaching supplies	Departmental administrative expense	Department's allocated share of college or school administrative expense	Total teaching expenditures
1	2	3	4	5	6
Department of:					
Botany.....	\$5,263.06	\$264.99	\$554.85	\$649.02	\$6,731.92
Chemistry.....	15,585.23	7,268.22	1,250.92	1,836.09	25,940.46
English.....	31,064.94	92.83	2,047.23	1,754.99	34,959.99
Foreign languages.....	6,232.29	44.29	271.20	373.90	6,921.68
History.....	18,026.58	66.25	168.00	796.63	19,057.46
Mathematics.....	21,217.80	50.75	1,020.99	1,040.42	23,329.96
Music.....	16,811.65	127.90	1,166.23	627.70	18,733.48
Physics.....	8,142.20	303.55	197.40	336.77	8,979.92
Physical education.....	13,555.35	350.95	2,743.01	527.35	17,176.66
Zoology.....	5,664.18	370.93	623.56	385.65	7,044.32
Civil engineering.....	10,963.30	274.24	947.23	2,125.80	14,310.57
Electrical engineering.....	6,564.84	325.20	1,305.08	1,149.85	9,344.97
Mechanical engineering.....	11,470.52	224.40	833.08	1,814.06	14,342.06
College or school of:					
Arts and sciences.....	149,797.51	9,682.50	13,310.27	18,944.79	181,735.07
Agriculture.....	30,570.06	32,544.05	14,664.86	19,235.15	87,044.12
Commerce and business.....	30,184.66	585.60	986.83	1,321.58	34,972.77
Education.....	18,063.78	311.21	603.07	16,644.40	25,622.42
Engineering.....	55,007.01	3,317.72	6,632.53	18,878.26	73,835.52

¹ Includes college or school administrative salaries and administrative supplies combined.

² National Committee on Standard Reports for Institutions of Higher Education. Financial Reports for Colleges and Universities, Form 91, p. 226. Chicago, Ill., The University of Chicago Press, 1935.

Unit costs of teaching by department and by college or school.—With the number of student-credit-hours and the expenditures for each department and college or school for the several classifications available, the universities proceeded to the computation of the unit costs for each of them.

To illustrate this procedure, the number of student-credit-hours for the department of botany in University A was 5,311, as shown in column 2 of table 1. The amount of teaching salaries for this same department in University A was \$5,263.06, as indicated by column 2 of table 2. By dividing 5,311 into \$5,263.06, the unit costs of teaching salaries for the department of botany were found to be \$0.99. Similarly, the number of student-credit-hours for the college of arts and sciences in University A was 63,755 and the amount of teaching salaries \$149,797.51, the unit costs being \$2.35.

Table 3 gives the figures for teaching salaries by department and by college and school in eight of the universities computed according to this procedure. For the sake of brevity the unit costs of teaching supplies, departmental administration, and college or school administration have been combined. The figures for these combined items are contained in table 4 in eight universities. One university did not compute the unit costs of the several classifications under teaching, such as teaching salaries, teaching supplies, departmental administration, and college or school administration. For this reason the institution has been omitted from tables 3 and 4. The unit costs of total teaching by department and by college or school for all nine universities are presented in table 5.

TABLE 3.—Unit costs of teaching salaries by department and by college or school in 8 universities

Department and college or school	Cost per student-credit-hour for teaching salaries in—							
	University A	University B	University C	University D	University E	University F	University G	University H
1	2	3	4	5	6	7	8	9
Department of:								
Botany.....	\$0.99		\$6.22			\$11.61	\$3.27	
Chemistry.....	1.03	\$2.30	7.02	\$7.21	\$3.47		2.68	\$2.60
Classical languages.....			8.27	4.68	2.79	23.19	16.93	9.70
English.....	2.23	3.39	2.99	3.25	2.48	3.82	1.55	4.08
Foreign languages.....	2.17	3.09	3.43	3.61	2.90	4.64	2.35	3.29
History.....	4.02	1.86	3.18	2.72	1.56	4.75	2.28	2.26
Home economics.....				4.40	1.83		5.38	4.04
Mathematics.....	2.77	3.57	4.50	3.42	2.43	5.68	1.93	3.91
Music.....	6.17		9.61		3.01	9.39	7.65	4.55
Philosophy.....			3.47	3.14	1.77	6.90		5.74
Physics.....	3.95	3.26	5.56	14.29	1.48	8.75	3.89	2.97
Political science.....			6.64		2.18		1.63	2.56
Physical education.....	4.69		2.31	7.24	6.50		2.57	
Psychology.....			1.99	2.31	1.13	6.22	1.60	3.51
Zoology.....	1.96		4.25			9.72	3.81	
Civil engineering.....	3.27	5.95	6.12	4.99			14.61	14.68
Electrical engineering.....	5.15	5.82	5.92	6.57		18.03	7.02	9.00
Mechanical engineering.....	4.12	3.77	5.23	7.88		13.92	3.06	6.68
College or school of:								
Arts and sciences.....	2.35		4.28	4.21	2.24	5.94	2.17	3.43
Agriculture.....	2.82		31.59				2.11	
Commerce and business.....	1.95		3.35	2.95	1.54	4.98		
Education.....	2.28		4.18		5.84	8.79	2.69	6.56
Engineering.....	4.61	3.58	5.60	4.49	6.57	7.82	3.22	5.68
Law.....			10.03	6.77	2.32		7.58	
Pharmacy.....				2.69	5.68			6.65

TABLE 4.—Unit costs of teaching supplies, departmental administration and college or school administration combined by department and by college or school in 8 universities

Department and college or school	Cost per student-credit-hour for teaching supplies, departmental administration, and college or school administration combined in—							
	University A	University B	University C	University D	University E	University F	University G	University H
1	2	3	4	5	6	7	8	9
Department of:								
Botany.....	\$0.28		\$1.03			\$3.46	\$0.67	
Chemistry.....	.69	\$2.34	1.72	\$6.12	\$2.19		1.09	\$1.75
Classical languages.....			.28	.89	.30	4.07	1.73	2.02
English.....	.28	.47	.34	.65	.46	.80	.27	.38
Foreign languages.....	.24	.14	.27	.69	.10	.86	.35	.69
History.....	.23	.46	.29	.39	.21	1.28	.40	.35
Home economics.....				1.90	.34		2.11	1.01
Mathematics.....	.28	.17	.28	.56	.13	1.16	.31	.72
Music.....	.71		.94		1.56	1.00	1.37	.70
Philosophy.....			.23	.23	.43	1.77		.37
Physics.....	.41	1.12	.60	5.08	.65	2.62	.79	.65
Political science.....			1.64		.13		.30	.57
Physical education.....	1.25		.47	2.71	.10		2.27	
Psychology.....			.13	.63	.36		.33	.53
Zoology.....	.48		1.15			2.69	1.00	
Civil engineering.....	.99	3.23	.91	1.36		3.65	1.75	4.28
Electrical engineering.....	2.18	7.14	1.43	1.63		7.24	3.58	3.68
Mechanical engineering.....	1.03	1.42	.96	1.39		4.17	2.00	3.21
College or school of:								
Arts and sciences.....	.50		.58	1.35	.50	1.51	.52	.79
Agriculture.....	5.22		5.09				1.94	
Commerce and business.....	.32		.63	.92	.30	.99		
Education.....	.96		.66		.83	3.72	1.50	2.54
Engineering.....	1.57	1.36	.94	.97	.84	2.87	2.16	2.32
Law.....			2.14	2.40	.82		.89	
Pharmacy.....				.89	1.66			3.98

TABLE 5.—Unit total teaching costs by department and by college or school in 9 universities

Department and college or school	Total teaching cost per student-credit-hour in—								
	University A	University B	University C	University D	University E	University F	University G	University H	University I
1	2	3	4	5	6	7	8	9	10
Department of:									
Botany.....	\$1.27		\$7.25			\$15.07	\$3.94		
Chemistry.....	1.72	\$4.64	8.74	\$13.33	\$5.66		3.77	\$4.33	\$6.23
Classical languages.....			8.55	5.57	3.09	27.26	18.66	11.72	
English.....	2.51	3.86	3.33	3.90	2.94	4.62	1.82	4.46	3.71
Foreign languages.....	2.41	3.23	3.33	4.30	3.00	5.50	2.70	3.98	3.75
History.....	4.25	2.32	3.97	3.11	1.77	6.03	2.68	2.61	2.79
Home economics.....				6.30	2.17		7.49	5.05	6.94
Mathematics.....	3.05	3.74	4.78	3.98	2.56	6.84	2.24	4.63	3.17
Music.....	6.88		10.55		4.57	10.39	9.02	5.25	
Philosophy.....			3.70	3.37	2.20	8.67		6.11	3.08
Physics.....	4.36	4.38	6.16	19.37	2.13	11.37	4.68	3.62	4.72
Political science.....			8.28		2.31		1.93	2.93	3.17
Physical education.....	5.94		2.78	9.05	6.60		4.84		4.34
Psychology.....			2.12	2.94	1.49	8.54	1.93	4.04	2.78
Zoology.....	2.44		5.40			12.41	4.81		
Civil engineering.....	4.26	9.16	7.03	6.39		18.26	3.63	18.96	9.00
Electrical engineering.....	7.33	12.96	7.26	8.20		25.27	10.60	12.68	19.13
Mechanical engineering.....	5.15	5.19	6.19	9.27		18.09	5.06	9.89	5.85
College or school of:									
Arts and sciences.....	2.85		4.86	5.56	2.74	7.45	2.69	4.22	3.76
Agriculture.....	8.04		36.68				4.05		
Commerce and business.....	2.27		3.98	3.87	1.84	5.97			3.51
Education.....	3.24		4.84		6.68	12.51	4.19	9.10	5.89
Engineering.....	6.18	4.94	6.54	5.46	7.42	10.69	5.38	8.00	6.65
Law.....			12.17	9.17	3.14		8.47		2.66
Pharmacy.....				3.68	7.34			10.63	

OVERHEAD COSTS

The overhead costs of the universities represented expenditures for the institution as a whole and included general institutional administration, libraries, and operation and maintenance of the physical plant. A portion of these expenditures was made for instructional purposes and another for noninstructional purposes. Since this study was limited to costs of instruction, it was necessary for the universities to segregate the expenditures devoted to instruction for each of these items.

Moreover, each department and college or school had to have allocated to it its proportionate share of the segregated instructional overhead expenditures. The amounts of overhead expenditures charged to the departments and to the colleges or schools as a result of this allocation were used as bases for computing the unit overhead costs for them. Different procedures were followed in allocating the expenditures for general institutional administration, for libraries, and for operation and maintenance of the physical plant.

Allocated share of institutional administration expenditures by department and by college or school.—Among the units of the universities performing institutional administrative functions were the president's office, the governing board, the council on administration, the business office, and similar offices. Their functions included the administration of instruction, organized research, noninstructional extension and miscellaneous public services, auxiliary enterprises and activities, and other noneducational activities.

In order to ascertain the amount of the expenditures for these offices to be segregated and charged to instructional administration, it was necessary to obtain a distribution of their time as in the case of the faculty members. This was accomplished by the filling in of a blank form in which the percentage of time devoted to each of the functions for the several offices was indicated. The percentage devoted to the administration of instruction was then used to compute the amount of expenditures to be charged to instructional administration for each of them.

The amounts of expenditures for a number of other central offices in the universities were charged directly to institutional administration of instruction since their entire time was devoted to such purpose. These included the office of the registrar, dean of men and dean of women together with the placement, stenographic, information, and similar bureaus. Other expenditures of this character were those for student health services, entrance examinations, commencements, convocations, publication of catalogs, and the like. Further expenditures charged to institutional administration of instruction were the portions of the salaries of faculty members as previously calculated from the distribution of their time.

By adding together these various expenditures the total sum expended for institutional administration was obtained. The universities then proceeded to allocate the share that was to be charged to each college or school and to each department. Such allocation was made on a basis of a budget-

ary pro-rating factor and a student-credit-hour pro-rating factor in much the same way as that followed in distributing college and school administrative expenditures to the departments within the college or school. The bases for both factors were the total expenditures for institutional administration.³

Allocated share of expenditures for libraries by department and by college or school.—Although established primarily for the instruction of students, the facilities of the libraries of the universities were used for a number of other functions. In addition to instruction, these functions included organized research, noninstructional extension, and public services.

For the purpose of obtaining the portion of the expenditures of libraries devoted to instruction, the universities were required to secure a percentage distribution of the use made of the libraries. Again a blank form was utilized. This form filled in by the librarians showed the percentage of use of the libraries for the several functions. Upon a basis of the percentage use for instruction as shown in the form, the expenditures for libraries devoted to instruction were computed.

Several plans were followed in securing the amount of the allocated share of these expenditures charged to each department and college or school. One consisted of determining the extent to which the library facilities were used by the students of the different departments and colleges or schools through actual figures available in the records of the libraries or through a percentage distribution made by the library head. A second plan provided for the allocation according to the annual expenditures for books by the departments and colleges or schools. There were some departments and colleges or schools which maintained their own libraries separate from the general library. It was necessary to include the amount covering the expense of operating such libraries in the allocated share of libraries' expenditures to these particular departments and colleges or schools.⁴

Allocated share of expenditures for physical plant by department and by college or school.—The extent that each department and college or school used the physical plant was the basis for allocating the amounts to be charged to them out of the expenditures for its operation and maintenance. A complete plant utilization analysis involving the use made of all buildings in the university was necessary to obtain this information.

The initial step undertaken in this analysis was the compiling of the number of hours per week which each classroom, laboratory, and office was used in each of the buildings. Such data were secured from the institutional records showing the assignment of space. The next step consisted of recording the area of square feet in each classroom, laboratory, and office. By multiplying the number of hours used per week by the area of square feet in each room, laboratory, and office, the square-foot-hours of space were obtained for each of them.

³ Ibid., Forms 63 and 64, pp. 207-208.

⁴ Ibid., Forms 67 and 68, pp. 211-212.

With this information at hand it was then possible to secure a total of the square-foot-hours of space used by the colleges or schools. The procedure followed was to list the classrooms, laboratories, and offices assigned to the individual college or school together with the number of square-foot-hours of space. The addition of these square-foot-hours of space gave the total square-foot-hours of space for the entire university. By similar compilation the square-foot-hours of space used by each department within the college or school were secured. One of the advantages of this procedure was that only space actually used for instruction was included for the different buildings. All space utilized for dormitories, dining halls, cafeterias, and other noninstructional enterprises was disregarded.

The allocated share to be charged to the colleges or schools was based on a pro-rating factor derived by dividing the total physical plant expenditures by the total square-foot-hours of space for the entire university. The number of square-foot-hours of space used by each college or school was multiplied by this pro-rating factor, the product being the particular college or school's allocated share of the physical plant expenditures. Similarly, in the case of the departments, the pro-rating factor was found by dividing the total physical plant expenditures for the college or school by its total square-foot-hours of space. The number of square-foot-hours of space used by each department multiplied by the pro-rating factor gave the allocated share of physical plant expenditures to be charged to the particular department.⁶

TABLE 6.—Amounts of overhead expenditures including allocated share of general institutional administration, libraries, and physical plant by department and by college or school in University A

Department and college or school	Allocated share of institutional administration	Allocated share of expenditures for libraries	Allocated share of expenditures for maintenance of physical plant	Total overhead expenditures
1	2	3	4	5
Department of:				
Botany.....	\$2,055.00	\$359.05	\$1,289.64	\$3,703.69
Chemistry.....	5,811.00	1,023.71	6,549.37	13,384.08
Eng'.....	5,555.00	941.38	4,842.23	11,338.61
Foreign languages.....	1,184.00	193.96	1,154.13	2,532.09
History.....	2,521.00	303.02	2,230.48	5,054.50
Mathematics.....	3,294.00	517.24	3,238.06	7,049.30
Music.....	1,986.00	184.05	6,472.41	8,642.46
Physics.....	1,066.00	139.22	1,815.40	3,020.62
Physical education.....	1,670.00	195.26	13,478.58	15,343.84
Zoology.....	1,221.00	195.26	1,996.39	3,412.65
Civil engineering.....	1,963.00	2,513.13	2,120.73	6,596.86
Electrical engineering.....	1,061.00	955.17	1,731.75	3,747.92
Mechanical engineering.....	1,674.00	2,083.84	3,184.86	6,942.70
College or school of:				
Arts and sciences.....	28,313.00	4,310.34	46,161.19	78,784.53
Agriculture.....	10,465.00	7,721.44	15,625.22	33,811.66
Commerce and business.....	6,501.00	6,306.47	4,700.01	17,507.48
Education.....	3,982.00	223.63	4,042.37	8,248.00
Engineering.....	8,195.00	8,943.53	18,001.94	35,140.47

Table 6 shows the amounts of overhead expenditures classified according to the allocated share for institutional administration, libraries, and physical

⁶ Ibid., Forms 75 and 76, pp. 220-221.

plant to the several departments and colleges in University A. Similar tabulations were made by the other universities covering these various items. The final column of the table gives the total overhead expenditures by department and by college or school.

Unit costs of overhead by department and by college or school.—After obtaining the allocated expenditures for the several classifications of overhead the universities computed the unit costs for each department or college or school on a basis of student-credit-hours. Table 7 contains the figures for the two items of general institutional administration and libraries combined in eight universities, these items being combined for the purpose of brevity. The unit costs of operation and maintenance of the physical plant in eight universities are given in table 8. As in the case of teaching, one university failed to compute the costs separately for these two classifications of overhead. Table 9 gives the unit total overhead costs by department and by college or school for all nine universities.

TABLE 7.—Unit costs of general institutional administration and libraries combined, by department and by college or school in 8 universities

Department and college or school	Cost per student-credit-hour for general institutional overhead and libraries combined in—							
	University A	University B ¹	University C	University D	University E	University F	University G	University H
1	2	3	4	5	6	7	8	9
Department of:								
Botany.....	\$0.46		\$1.55			\$1.38	\$1.88	
Chemistry.....	.45	\$0.84	1.71	\$1.77	\$1.30		1.68	\$0.52
Classical languages.....			1.77	.99	1.14	2.24	6.34	1.02
English.....	.46	.84	1.10	1.12	1.10	.53	.99	.56
Foreign languages.....	.48	.69	1.12	.93	1.05	.63	1.26	.54
History.....	.63	.66	1.19	.80	1.01	.71	1.61	.56
Home economics.....				.59	.99		3.43	.62
Mathematics.....	.50	.75	1.28	.78	.93	.71	1.12	.49
Music.....	.80		2.45		1.25	.77	2.57	.59
Philosophy.....			1.16	1.03	1.16	.87		.66
Physics.....	.59	.85	1.38	2.60	1.03	1.04	1.98	.47
Political science.....			2.24		1.08		1.22	.44
Physical education.....	.65		.75	.80	1.65		1.84	
Psychology.....			1.02	.67	.95	.74	1.21	.56
Zoology.....	.49		1.35			1.04	2.75	
Civil engineering.....	1.34	.87	1.72	.66		1.77	2.57	1.72
Electrical engineering.....	1.58	2.18	1.46	.70		1.59	4.21	1.37
Mechanical engineering.....	1.36	.87	1.32	.67		1.44	2.46	1.04
College or school of:								
Arts and sciences.....	.52		1.34	.96	1.06	.75	1.41	.55
Agriculture.....	1.68		5.67				1.63	
Commerce and business.....	.83		1.26	1.25	.53	.61		
Education.....	.53		1.25		1.94	.96	1.14	1.05
Engineering.....	1.43	.88	1.41	.64	1.77	.89	2.79	.89
Law.....			2.37	1.47	1.61		3.42	
Pharmacy.....				.90	2.51			1.37

¹ Includes cost for general institutional overhead only. Unit costs for library not furnished by the university.

TABLE 8.—Unit costs for physical plant maintenance by department and by college or school in 8 universities

Department and college or school	Cost per student-credit-hour for physical plant maintenance in—							
	University A	University B	University C	University D	University E	University F	University G	University H
	1	2	3	4	5	6	7	8
Department of:								
Botany.....	\$0.24		\$5.51				\$1.20	\$3.69
Chemistry.....	.43	\$1.40	4.80	\$1.07	\$2.45		2.49	\$1.38
Classical languages.....			.90	.38	1.03	2.33	5.11	1.63
English.....	.35	1.12	.47	.41	1.19	.35	.27	.61
Foreign languages.....	.40	.68	.33	.34	.97	.46	1.16	.78
History.....	.50	.77	.37	.19	1.47	.56	1.04	.63
Home economics.....				.76	1.46		3.33	1.84
Mathematics.....	.42	.71	.35	.23	.97	.58	.79	.82
Music.....	2.37		3.91		3.95	.96	.65	4.56
Philosophy.....			.56	.32	1.42	.76		1.56
Physics.....	.88	1.19	1.97	1.52	1.41	.88	2.63	.92
Political science.....			.53		1.13		.49	.66
Physical education.....	4.66		1.93	8.17	4.54		14.03	
Psychology.....			.28	.15	.60	.54	.59	.86
Zoology.....	.69		3.33			.85	2.09	
Civil engineering.....	.63	1.22	1.23	7.77		4.15	2.17	2.97
Electrical engineering.....	1.36	2.36	1.97	5.64		2.79	6.78	4.48
Mechanical engineering.....	1.14	1.56	6.51	1.62		3.15	3.48	2.76
College or school of:								
Arts and sciences.....	.72		1.12	.90	1.42	.59	1.14	1.15
Agriculture.....	1.45		.41				2.08	
Commerce and business.....	.30		.49	.41	.88	.34		
Education.....	.51		1.36		3.45	.47	.83	1.54
Engineering.....	1.51	1.31	3.37	2.57	2.65	1.66	2.30	2.44
Law.....			1.51	3.01	5.01		1.85	
Pharmacy.....				.40	2.58			.13

TABLE 9.—Unit total overhead costs by department and by college or school in 9 universities

Department and college or school	Cost per student-credit-hour for total overhead in—								
	University A	University B	University C	University D	University E	University F	University G	University H	University I
	1	2	3	4	5	6	7	8	9
Department of:									
Botany.....	\$0.70		\$7.06				\$2.58	\$5.57	
Chemistry.....	.88	\$2.24	6.51	\$2.84	\$3.75		4.17	\$1.90	\$3.90
Classical languages.....			2.67	1.37	2.17	4.57	11.45	2.65	
English.....	.81	1.96	1.57	1.53	2.29	.88	1.26	1.17	1.43
Foreign languages.....	.88	1.37	1.45	1.27	2.02	1.09	2.42	1.32	1.98
History.....	1.13	1.43	1.56	.99	2.48	1.27	2.65	1.19	1.38
Home economics.....				1.35	2.45		6.76	2.46	3.92
Mathematics.....	.92	1.46	1.63	1.01	1.90	1.29	1.91	1.31	1.58
Music.....	3.17		6.36		5.20	1.73	3.22	5.15	
Philosophy.....			1.72	1.35	2.58	1.63		2.22	1.86
Physics.....	1.47	2.02	3.35	4.12	2.44	1.92	4.61	1.39	3.98
Political science.....			2.77		2.21		1.71	1.10	1.51
Physical education.....	5.31		2.68	8.97	6.19		15.87		5.32
Psychology.....			1.30	.82	1.55	1.28	1.80	1.42	1.75
Zoology.....	1.18		4.68			1.89	4.84		
Civil engineering.....	1.97	3.33	2.95	8.43		5.92	4.74	4.69	3.90
Electrical engineering.....	2.94	4.54	3.43	6.34		4.38	10.99	5.85	13.08
Mechanical engineering.....	2.50	2.43	7.83	2.29		4.59	5.94	3.80	5.56
College or school of:									
Arts and sciences.....	1.24		2.46	1.86	2.48	1.34	2.55	1.70	2.13
Agriculture.....	3.13		6.09				3.71		
Commerce and business.....	1.13		1.75	1.66	1.41	.95			1.87
Education.....	1.04		2.61		5.39	1.43	1.97	2.59	2.31
Engineering.....	2.94	2.19	4.78	3.21	4.42	2.55	5.09	3.33	5.41
Law.....			3.88	4.48	6.62		5.27		1.80
Pharmacy.....				1.30	5.09			1.50	

TOTAL INSTRUCTIONAL COSTS

Figures on the total instructional costs were obtained by adding together the total teaching expenditures and the total overhead expenditures for each department and college or school. This sum for each department and college or school was then divided by the number of student-credit-hours for the particular department and college or school. The unit costs thus derived are shown in table 10 for the nine universities.

TABLE 10.—Unit total instructional costs by department and by college or school in 9 universities

Department and college or school	Cost per student-credit-hour for total instruction in—									
	University A	University B	University C	University D	University E	University F	University G	University H	University I	
1	2	3	4	5	6	7	8	9	10	
Department of:										
Botany.....	\$1.97		\$14.31			\$17.65	\$9.51			
Chemistry.....	2.60	\$6.88	15.25	8.17	\$9.41		7.94	\$6.25	\$10.13	
Classical languages.....			11.22	6.94	5.26	31.83	30.11	14.37		
English.....	3.32	5.82	4.90	5.43	6.23	5.50	3.08	5.63	5.14	
Foreign languages.....	3.29	4.60	5.15	5.57	5.02	6.59	5.12	5.30	5.73	
History.....	5.38	3.75	5.03	4.10	4.25	7.30	5.33	3.80	4.17	
Home economics.....				7.65	4.62		14.25	7.51	10.86	
Mathematics.....	3.97	5.20	6.41	4.99	4.46	8.13	4.15	5.94	4.75	
Music.....	10.05		16.91		9.77	12.12	12.24	10.40		
Philosophy.....			5.42	4.72	4.78	10.50		8.33	4.94	
Physics.....	5.83	6.40	9.51	23.49	4.57	13.29	9.29	5.01	8.70	
Political science.....			11.05		4.52		3.64	4.03	4.68	
Physical education.....	11.25		5.46	18.92	12.79		20.71		9.66	
Psychology.....			3.42	3.76	3.04	9.82	3.73	5.46	4.53	
Zoology.....	3.62		10.08			14.50	9.65			
Civil engineering.....	6.23	12.49	9.98	14.78		24.18	8.37	23.65	12.90	
Electrical engineering.....	10.27	17.50	10.69	14.54		29.65	21.59	18.53	32.21	
Mechanical engineering.....	7.65	7.62	14.02	11.56		22.68	11.00	13.69	11.41	
College or school of:										
Arts and sciences.....	4.09		7.32	7.42	5.22	8.79	5.24	5.92	5.89	
Agriculture.....	11.17		42.76				7.76			
Commerce and business.....	3.40		5.73	5.53	3.25	6.92			5.38	
Education.....	4.88		7.45		12.07	13.94	6.16	11.69	8.80	
Engineering.....	9.12	7.13	11.32	8.67	11.84	13.24	10.47	11.33	12.06	
Law.....			16.05	13.65	9.76		13.74		4.46	
Pharmacy.....				4.98	12.43			12.13		

Unit costs of extension and summer school.—In addition to computing unit costs by department and by college or school for the regular academic year of 1934–35, two universities made such computations for their extension service and summer school.

Generally, the same procedure for compiling the number of student-credit-hours and the expenditures for instruction was followed except that the figures were secured by courses of study given in the extension service and the summer school. The student-credit-hours were obtained on a basis of the number of credits granted in the courses and the number of students taking the courses. In the case of extension both extension classes and correspondence courses were included. The expenditures comprised the various classifications of teaching and overhead based on the actual amounts expended for these purposes. By totalling the figures for student-credit-

hours by courses and for the various items of expenditures, the total student-credit-hours and the total instructional expenditures were secured in each case.

The results in one university showed the total cost of instruction for extension was \$11.16 per student-credit-hour. In the other university the cost for extension was \$7.55 per student-credit-hour. For the summer school the total instructional cost was \$12.36 per student-credit-hour in the first university and \$8.91 per student-credit-hour in the second.

Chapter IV

Costs for Institution as Whole

THE STUDENT-CREDIT-HOURS and expenditures for instruction comprising the two factors of measurement of instructional costs were built up for the institution as a whole on the data compiled for the colleges or schools.

Figures showing the total student-credit-hours for the institution as a whole consisted of the sum of the student-credit-hours for all the colleges and schools in the university. As already pointed out, the student-credit-hours given for individual colleges or schools in table 1 of chapter II represented only selected colleges or schools in the universities. It was necessary, therefore, for each university to include other colleges or schools omitted from this table in order to secure the total student-credit-hours for the institution as a whole.

A similar procedure was pursued in obtaining the expenditures for the institution as a whole for the various teaching and overhead items. By adding the expenditures for teaching salaries, teaching supplies, and college or school administration, for all colleges or schools, the expenditures for the institution as a whole for each of these teaching classifications were secured. In the same manner, the sums of the expenditures for general institutional administration, libraries, operation and maintenance of the physical plant, and total overhead of the colleges or schools gave the expenditures for the institution as a whole for each of these overhead items. The total teaching expenditures plus the total overhead expenditures showed the total instructional expenditures for the institution as a whole.

Unit costs for institution as whole per student-credit-hour.—Table 11 presents the unit instructional costs for the institution as a whole on a student-credit-hour basis for the nine universities. The table also shows the total student-credit-hours and the amounts of total expenditures for the several main items. In column 2 of the table are given the total student-credit-hours for each university. In column 3 is shown the amount of the total teaching expenditures and in column 4 the cost per student-credit-hour for teaching. The amount of the total overhead expenditures together with the cost per student-credit-hour for overhead are given in columns 5 and 6. Finally in columns 7 and 8 are shown the amount of total instructional expenditures and the instructional cost per student-credit-hour. Figures showing the cost per student-credit-hour in columns 4, 5, and 6 of the table were obtained by dividing

the total student-credit-hours in column 2 into the amount of the total teaching expenditures, total overhead expenditures, and total instructional expenditures in columns 3, 5, and 7, respectively, for each university.

TABLE 11.—Unit Costs for Institution as Whole in 9 Universities on Student-Credit-Hour Basis

University	Total student-credit-hours	Total teaching expenditures		Total overhead expenditures		Total instructional expenditures	
		Amount	Cost per student-credit-hour	Amount	Cost per student-credit-hour	Amount	Cost per student-credit-hour
1	2	3	4	5	6	7	8
A.....	125,220	\$436,328.29	\$3.48	\$184,540.75	\$1.48	\$620,869.04	\$4.96
B.....	41,253	203,688.00	4.94	90,464.00	2.19	294,152.00	7.13
C.....	144,736	901,779.19	6.23	411,024.66	2.84	1,312,803.85	9.07
D.....	105,395	973,899.03	9.24	243,963.94	2.31	1,217,862.97	11.55
E.....	43,796	144,512.13	3.30	123,527.71	2.82	267,839.84	6.12
F.....	197,848	1,535,319.96	7.76	270,620.15	1.37	1,805,940.11	9.13
G.....	60,809	208,695.00	3.43	175,670.00	2.89	384,365.00	6.32
H.....	146,213	708,854.14	4.85	268,938.85	1.84	977,792.99	6.69
I.....	45,703	181,032.11	3.96	103,608.35	2.26	284,642.17	6.23

Unit costs for institution as a whole per full-time student-equivalent.—The universities in addition to determining the unit costs on a student-credit-hour basis also computed such costs for the institution as a whole using the full-time student equivalent as the unit. The following figure shows graphically the results of this computation for the nine universities.

In order for the universities to compute the unit costs presented in figure 1, it was necessary for them to obtain the number of full-time students for the institution as a whole. Because of the fact that many students dropped out of the universities during the year, the count of the students registered or enrolled did not represent an accurate figure upon which to base the computation. The full-time-student equivalent, therefore, had to be obtained.

The full-time-student equivalent is defined as one student carrying a full, normal academic load over the year.¹ In all the nine universities, the full, normal academic load was regarded as approximately 30 semester hours of credit. The number of full-time students was thus secured by dividing the total student-credit-hours for the institution as a whole by 30 or the full, normal academic load. As an illustration, the total student-credit-hours for University A amounted to 125,220, as indicated by column 2 of table 11. Dividing 125,220 by 30 gave 4,174 full-time students. This same formula for calculating the full-time-student equivalent was used by the other universities.

Upon obtaining the number of full-time students, the unit costs figures per full-time student were secured by dividing the number of full-time

¹ National Committee on Standard Reports for Institutions of Higher Education. Financial Reports for Colleges and Universities, p. 178, Chicago, Ill., The University of Chicago Press, 1935.

students into the amount of total instructional expenditures, as given in column 7 of table 11 for each university.

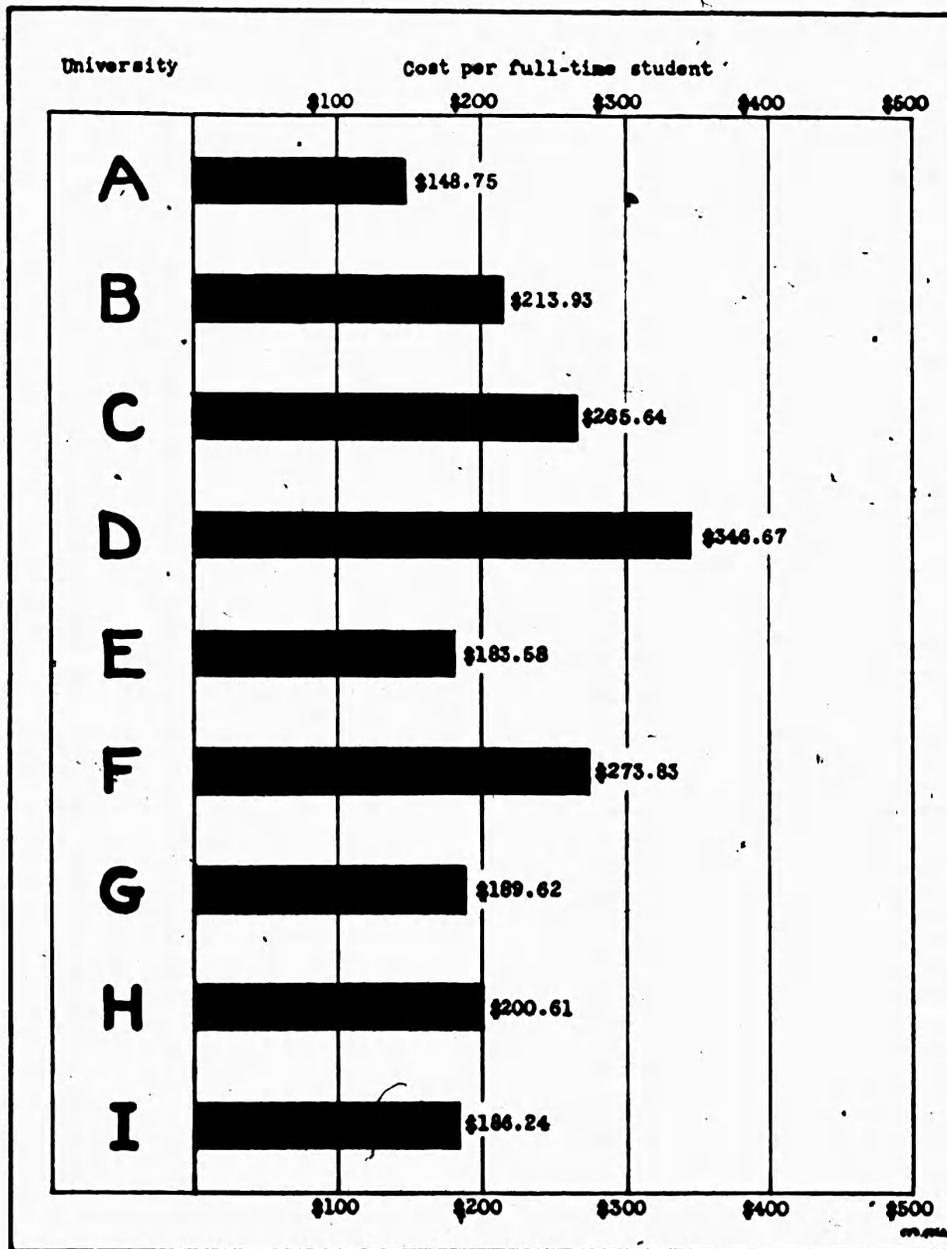


FIGURE 1.—Unit costs of instruction for institutions as a whole in 9 universities on full-time student equivalent basis.

Chapter V

Costs for Different Levels

THE DETERMINATION of the costs for the different levels of academic work involved the compilation of the data both with respect to student-credit-hours and instructional expenditures on an entirely new basis.

According to the plan followed by the universities, the number of student-credit-hours was first ascertained for the junior college, senior college, and graduate levels segregated by department and by college or school. The amounts of the instructional expenditures for each of the three levels similarly segregated were next secured. Finally, the unit costs were computed for each level by department and by college or school. Under this arrangement, it was possible to compare the costs for the different levels within the same department and within the same college or school.

Student-credit-hours for junior college, senior college, and graduate levels.—The number of student-credit-hours for each of the levels was compiled separately for each department. In obtaining the figures for the junior college level in a department, the universities listed all the courses on such level given in the department together with the number of student-credit-hours for each of them.¹ This procedure was greatly simplified by the practice prevailing in several of the universities of numbering freshman and sophomore year courses or those on the junior college level in denominations of 100, such as course 101, 102, etc. Having secured the number of student-credit-hours for each course in a department, these figures were totalled, giving the total student-credit-hours for the junior college level in the department. By this means the student-credit-hours for the junior college level in all of the departments of the university were obtained.

The same process was followed in securing the number of student-credit-hours for the senior college and graduate levels for each department. Graduate courses included seminars, faculty advisory meetings with students, and thesis conferences. It was necessary to equate the student-credit-hours involved in them. The student-credit-hours for the three levels by college or school were obtained by totalling the student-credit-hours for the various departments belonging to each college or school.

¹ The same method of calculating the number of student-credit-hours for each course was followed as described in chapter II.

It will be noted from the above that the several levels are here interpreted in terms of courses. Junior students might be enrolled in a sophomore course and the credit hours would be counted as of the junior college level.

Instructional expenditures for junior college, senior college, and graduate levels.— In determining the amounts of instructional expenditures for the junior college, senior college, and graduate levels, the universities were required to allocate the expenditures to the courses at the different levels. This involved the allocation of the various items making up the expenditures including teaching salaries, teaching expenditures other than salaries, institutional administration and libraries, and operation and maintenance of the physical plant.

The teaching salaries were allocated through a percentage distribution of the time of the faculty members devoted to teaching junior college, senior college, and graduate courses obtained through a blank form filled in by them.² These percentages were then used for calculating the portions of the salary of the faculty member to be charged to the different levels. By listing the faculty members in a department and adding together the portions of their salaries charged to each level, the universities obtained the amount of teaching salaries for the different levels in the department. The same procedure was employed with respect to every department. By summing the figures for the departments within each college or school the amounts of teaching salaries for the several levels by college or school were obtained.³

Allocation of teaching expenditures other than salaries was made on a basis of the student-credit-hours for the different levels. This consisted of finding the percentage that the number of student-credit-hours for each level was of the total student-credit-hours for each department. With these percentages the proportionate amounts of the total teaching expenditures other than salaries for the department to be charged to the different levels were obtained. The total teaching expenditures other than salaries for each department were already available from data previously collected. This procedure was followed for all the departments. In securing the figures for each college or school, a similar percentage distribution of student-credit-hours for the different levels was utilized.⁴

Expenditures for institutional administration and libraries were allocated to the different levels through two pro-rating factors. One was the percentage distribution of the student-credit-hours and the other the percentage distribution of the teaching salaries within each department. To illustrate the procedure, the percentage of student-credit-hours for the junior college level was first used in calculating the amount of the total expenditures for a department to be pro-rated to that level. Next, the percentage of the teaching salaries for the junior college level was similarly used in

² National Committee on Standard Reports for Institutions of Higher Education, *Financial Reports for Colleges and Universities*, Form 56, p. 199. Chicago, Ill., The University of Chicago Press, 1935.

³ *Ibid.*, Forms 88, 89, and 90, pp. 234-236.

⁴ *Ibid.*, Forms 91 and 92, pp. 237-238.

determining the amount of such expenditures to be pro-rated to the level. In order to give equal weight to each factor, the amounts thus derived were then divided by two, giving the amount allocated to the junior college level. This same method was followed in obtaining the amount allocated to the senior college level and to the graduate level within each department. The pro-rating factors were also utilized in making the allocations to the different levels for each college and school.⁵

The extent of the use of the physical plant constituted the basis for allocating the expenditures for the operation and maintenance of the physical plant to the different levels. This was computed according to the square-foot-hours of space used in the courses for each of the levels. The procedure provided for the compilation of the number of square-foot-hours of space used for the junior-college, senior-college, and graduate levels in a department. A percentage distribution for the different levels was next obtained based on the total number of square-foot-hours for the department. With these percentages the amount of the total expenditures of the department for the physical plant to be pro-rated to each of the levels was secured. The allocations were made in the same way for all the departments and colleges or schools.⁶

Having obtained the allocated amounts of expenditures for teaching salaries, teaching expenditures other than salaries, institutional administration and libraries, and operation and maintenance of the physical plant to the different levels, the figures for the four items were totaled. By this means the total instructional expenditures for the junior-college, senior-college, and graduate levels were obtained for each department and for each college or school. In table 12 is presented the number of student-credit-hours and the instructional expenditures for each of the levels by department and by college or school as compiled by University A. The other universities made similar compilations.

Unit costs for junior college, senior college, and graduate levels by department and by college or school.—The unit costs based on the student-credit-hours and the instructional expenditures were computed for the different levels separately by the universities. Tables 13, 14, and 15 give such costs per student-credit-hour on the junior college, senior college, and graduate level, respectively, by department and by college or school in six universities. There were three universities which did not compile the required data for the computation of unit costs for the different levels in their institutions. A fourth university, while securing the costs for the junior college and senior college levels, did not compute such costs for the graduate level.

⁵ Ibid., Forms 93 and 94, pp. 239-241.

⁶ Ibid., Forms 95, 96, 97, and 98, pp. 242-245.

TABLE 12.—Number of units and amounts of total instructional expenditures for junior college, senior college, and graduate levels by department and by college or school in University A

Department and college or school	Junior-college level		Senior-college level		Graduate level	
	Number of student-credit-hours	Amount of instructional expenditures	Number of student-credit-hours	Amount of instructional expenditures	Number of student-credit-hours	Amount of instructional expenditures
1	2	3	4	5	6	7
Department of:						
Botany.....	4,984	\$7,902.96	323	\$2,530.82		
Chemistry.....	13,759	32,663.39	1,168	5,522.19	215	\$2,339.88
English ¹	10,983	33,230.39	2,633	10,761.49	309	2,325.34
Foreign languages.....	2,288	4,847.66	512	2,790.83	71	819.78
History ²	1,026	4,465.69	3,117	14,201.52	347	2,340.74
Mathematics.....	7,420	26,816.09	201	2,902.14	30	673.13
Music.....	2,205	17,517.01	516	9,835.71	2	2,007.75
Physics.....	1,939	9,130.00	104	2,898.85	15	475.00
Physical education.....	2,031	23,638.24	767	16,922.46	93	774.07
Zoology.....	2,580	7,797.77	300	2,582.93	6	80.76
Civil engineering.....	1,274	6,013.42	2,060	14,284.14	22	888.74
Electrical engineering.....	291	2,224.63	963	10,015.37	21	852.89
Mechanical engineering.....	1,669	9,879.68	1,089	10,778.37	24	626.71
College or school of:						
Arts and sciences.....	52,410	170,849.95	10,253	78,070.22	1,092	9,758.91
Agriculture.....	5,843	56,374.42	4,660	59,316.35	315	5,136.52
Commerce and business.....	9,555	24,582.55	5,881	23,409.02	18	274.26
Education.....	3,495	11,836.68	4,110	19,718.18	304	2,499.24
Engineering.....	5,507	43,604.71	5,919	55,860.98	516	9,347.30

¹ Department of English and Journalism.
² Department of History and Political Science.

TABLE 13.—Unit costs of total instruction on junior-college level by department and by college or school in 6 universities

Department and college or school	Cost per student-credit-hour for junior college level in—					
	University A	University C	University E	University F	University G	University I
1	2	3	4	5	6	7
Department of:						
Botany.....	\$1.58	\$8.27		\$10.72	\$8.02	
Chemistry.....	2.37	12.40	\$8.55		5.56	\$7.7
Classical languages.....		13.50	3.26	22.91	21.76	
English.....	3.03	4.97	4.54	4.30	20.95	4.21
Foreign languages.....	2.12	4.42	3.37	8.92	4.10	4.41
History.....	4.35	4.84	3.71	4.49		3.64
Home economics.....			4.13		12.05	8.72
Mathematics.....	3.61	5.29	3.79	7.13	3.06	4.12
Music.....	7.94	9.05	10.11	8.64	8.17	
Philosophy.....		3.92		6.53		3.84
Physics.....	4.71	7.95	3.56	10.58	6.29	5.57
Political science.....		9.53	2.99		2.69	4.09
Physical education.....	1.16	4.71	12.79		17.25	9.66
Psychology.....		3.44	2.13	6.61	2.93	4.60
Zoology.....	3.02	6.70		11.00	7.57	
Civil engineering.....	4.72	7.30		27.33	6.80	11.37
Electrical engineering.....	7.64	11.47		19.02	13.11	
Mechanical engineering.....	5.92	34.74		26.88	10.80	
College or school of:						
Arts and sciences.....	3.26	6.33	4.40	6.38	4.31	5.22
Agriculture.....	9.65				10.80	
Commerce and business.....	2.57	5.13	2.30	5.40		4.19
Education.....	3.39	5.40	7.70	8.47	5.66	10.03
Engineering.....	7.92	14.25	6.18	9.01	10.53	9.34

TABLE 14.—Unit costs of total instruction on senior-college level by department and by college or school in 6 universities

Department and college or school	Cost per student-credit-hour for senior-college level in—					
	University A	University C	University E	University F	University G	University I
1	2	3	4	5	6	7
Department of:						
Botany.....	\$7.84	\$29.29		\$25.01	\$12.18	
Chemistry.....	4.73	16.08	\$14.23		18.12	\$15.45
Classical languages.....		8.54	6.85	33.58	40.10	
English.....	4.09	4.51	6.95	5.10	4.55	6.98
Foreign languages.....	7.40	7.65	16.82	6.84	7.29	8.24
History.....	4.56	4.59	4.69	12.21	5.39	8.10
Home economics.....			9.62		17.17	35.26
Mathematics.....	14.44	5.36	9.78	12.34	10.19	6.14
Music.....	19.06	24.70	9.02	13.07	21.72	
Philosophy.....		5.84	4.84	10.42		8.19
Physics.....	23.07	12.27	24.83	16.81	12.28	42.29
Political science.....		12.44	8.58		6.50	6.16
Physical education.....	22.06	9.79			13.90	
Psychology.....		2.74	6.00	8.14	4.53	4.42
Zoology.....	8.61	12.30		17.14	15.55	
Civil engineering.....	6.93	10.26		21.41	8.55	13.90
Electrical engineering.....	10.40	10.67		21.23	26.16	32.20
Mechanical engineering.....	9.90	8.42		20.34	11.22	11.41
College or school of:						
Arts and sciences.....	7.61	7.98	7.82	9.24	7.47	7.85
Agriculture.....	12.73	42.76			18.52	
Commerce and business.....	3.98	6.82	5.23	7.08		7.24
Education.....	4.80	8.88	11.81	14.57	6.76	7.97
Engineering.....	9.44	9.32	19.13	16.71	12.02	14.84
Law.....			9.76		14.20	4.46

TABLE 15.—Unit costs of total instruction on graduate level by department and by college or school in 5 universities

Department and college or school	Cost per student-credit-hour for graduate level in—				
	University A	University C	University E	University F	University G
1	2	3	4	5	6
Department of:					
Botany.....		\$63.27		\$34.26	\$12.78
Chemistry.....	\$10.88	35.72	\$22.25		
Classical languages.....		35.99	20.75		35.33
English.....	7.53	9.05	5.75	19.39	
Foreign languages.....	11.55	12.25	60.84	21.37	5.32
History.....	6.75	39.28	19.59	21.18	4.79
Mathematics.....	22.44	28.22		16.76	3.48
Music.....	1,003.88	24.93		51.41	
Philosophy.....		43.41		31.79	
Physics.....	31.67	29.84	37.55	47.01	
Political science.....		21.35	4.57		
Physical education.....	8.32				9.00
Psychology.....		47.70		27.00	
Zoology.....	13.46	309.39		26.22	4.44
Civil engineering.....	40.40			57.42	
Electrical engineering.....	40.61	8.75		95.43	
Mechanical engineering.....	26.11			36.90	
College or school of:					
Arts and sciences.....	8.94	24.37	20.63	25.70	7.34
Agriculture.....	16.31				20.53
Commerce and business.....	15.24		19.28	20.20	
Education.....	8.88	10.05		15.31	13.38
Engineering.....	18.11	35.41	25.67	26.09	
Law.....		16.05			13.43

Unit costs of junior college, senior college, and graduate levels for institution as a whole.—Figure 2 shows in graphic fashion the unit costs per student-credit-hour of the different levels for the institution as a whole in six universities.

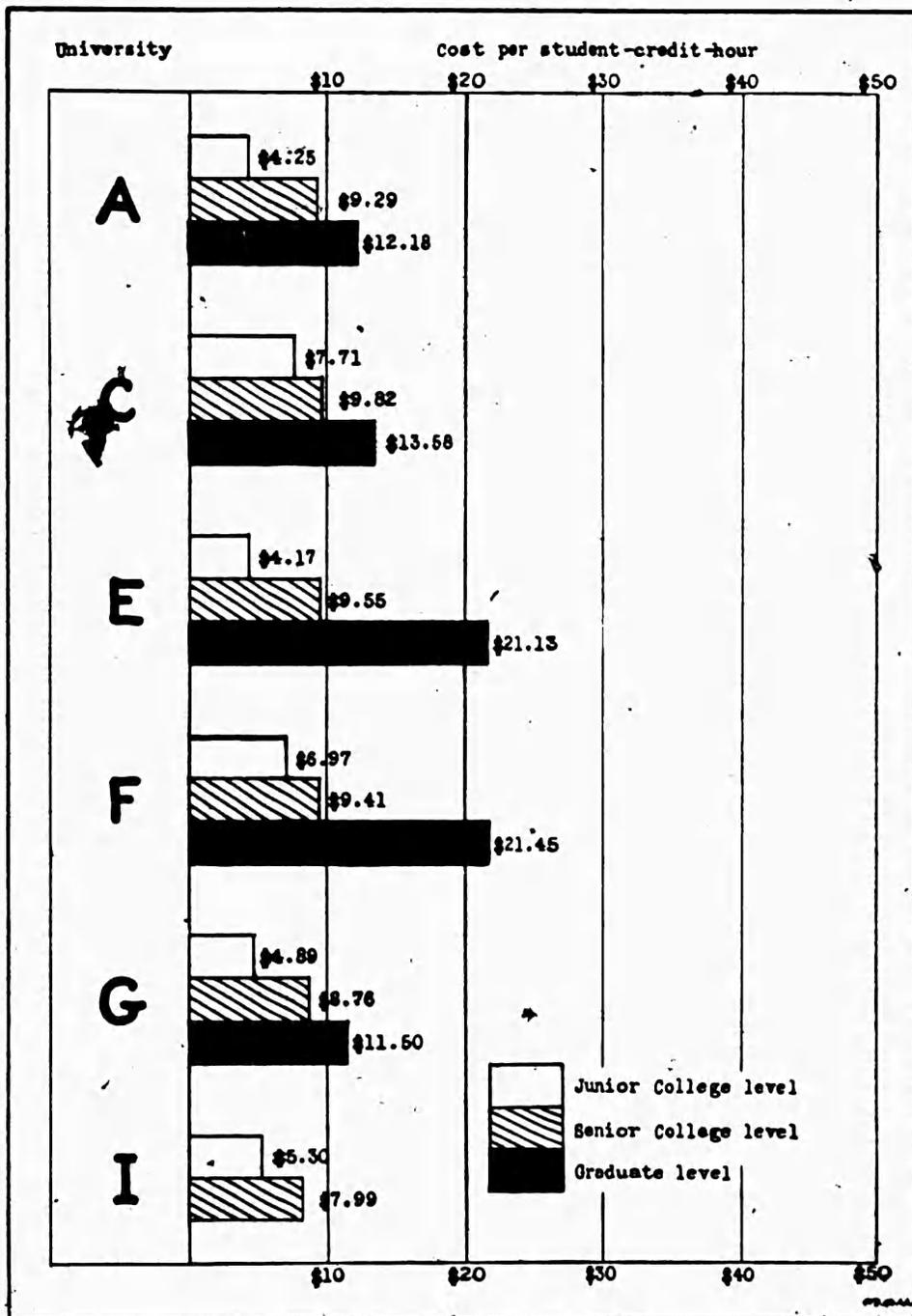


FIGURE 2.—Unit costs of junior college, senior college, and graduate level for institutions as a whole in 6 universities.

The unit costs shown in figure 2 were obtained by totalling the number of student-credit-hours and the instructional expenditures on each of the different levels for all colleges or schools. With these totals for the institution as a whole available, such costs were then computed by the universities. It will be noticed that in the case of one university the unit costs for the graduate level are not included since this institution did not compile the data with respect to its graduate work.

Chapter VI

Costs for Curriculums

IN ASCERTAINING the instructional costs of students in the various curriculums of the universities, a less complicated procedure was used than in the case of the other functions. This was due to the fact that the computations were based on costs already determined for the several departments.

The procedure consisted of listing the departments in which the required and elective courses composing the curriculum were taken by the students. The number of credit-hours together with the cost per student-credit-hour on the junior-college and senior-college level for each department was next indicated. Figures showing the cost per student-credit-hour for these two levels in each department had been previously computed. By multiplying the number of credit-hours by the cost per student-credit-hour, the total cost on the junior-college and on the senior-college level for each department was secured. The addition of the costs for all the departments gave the final cost for the curriculum.¹

In table 16 is presented a compilation for a typical student illustrating this procedure in computing the instructional costs for the bachelor of science curriculum with a major in physical science in University A.

TABLE 16.—*Computation of instructional cost for bachelor of science curriculum with major in physical sciences in University A*

Department	Junior-college level			Senior-college level			Total cost for department
	Credit hours	Cost per student-credit-hour	Total cost	Credit hours	Cost per student-credit-hour	Total cost	
1	2	3	4	5	6	7	8
Required courses: ¹							
Chemistry.....	12	\$2.37	\$28.44	16	\$4.73	\$75.68	\$104.12
English.....	12	3.03	36.36				36.36
Foreign languages.....	6	2.12	12.72				12.72
Mathematics.....	6	3.61	21.66				21.66
Physics.....	8	4.71	37.68	8	23.07	184.56	222.24
Physical education.....	2	1.16	2.32				2.32
Elective courses:							
Bacteriology.....	4	4.10	16.40	4	9.19	36.76	53.16
Chemistry.....				12	4.73	56.76	56.76
Commerce.....	6	2.57	15.42				15.42
Education.....	8	3.39	27.12	8	4.80	38.40	65.52
English.....				3	4.09	12.27	12.27
Mathematics.....	5	3.61	18.05				18.05
Speech.....	2	4.07	8.14				8.14
Zoology.....	4	3.02	12.08				12.08
Total.....	75		236.39	51		404.43	640.82

¹ Military science requiring 4 credit-hours for which no cost was given has been omitted.

² One university computed the costs for curriculums using the semester-hour-credit in place of the student-credit-hour.

According to column 2 in table 16, there were 12 credit-hours required in courses in the department of chemistry on the junior-college level in this curriculum. The cost per student-credit-hour on the junior-college level in the department of chemistry was \$2.37, as given in column 3. This figure is the same as that appearing in column 2 of table 13 in the preceding chapter showing the unit costs on the junior-college level for the department of chemistry in University A. Multiplying 12 by \$2.37 gave \$28.44 as the total cost on the junior-college level, as shown by column 4.

On the senior-college level the credit-hours in the department of chemistry amounted to 16 and the cost per student-credit-hour \$4.73, making a total cost of \$75.68, as indicated in column 7. The total cost of \$104.12 for the department of chemistry in column 8 was obtained by adding \$28.44 and \$75.68. The total costs based on the figures for the other departments listed in the table were similarly calculated, the final cost of the curriculum being \$640.82, as given at the bottom of column 8. It will be observed that the total credit-hours for the curriculum were 75 on the junior-college level and 51 on the senior-college level, or 126.

Costs for different curriculums in universities.—Of the nine universities, there were four which computed costs for curriculums. Since many curriculums were offered in each of these universities, costs were not obtained for all of them. In presenting the figures only a limited number is given.

The costs for curriculums leading to the bachelor's degree with majors in the various fields in the four universities were as follows:

University A

Biological sciences.....	\$609.98	Literature.....	\$519.93
Commerce.....	406.76	Mathematics.....	658.47
Dairy.....	1,606.12	Music.....	1,219.38
Education.....	817.00	Physical education.....	1,049.10
Foreign languages.....	515.00	Civil engineering.....	777.75
History.....	457.73	Electrical engineering.....	1,047.64
Household arts.....	812.62	Mechanical engineering.....	1,007.30

University C

Accounting.....	\$822.71	Music (piano).....	\$1,869.06
Applied arts.....	1,212.70	Speech.....	853.27
Chemistry.....	1,562.94	Civil engineering.....	1,435.02
Food and nutrition.....	1,661.29	Electrical engineering.....	1,445.97
Journalism.....	1,048.90	Mechanical engineering.....	1,556.90

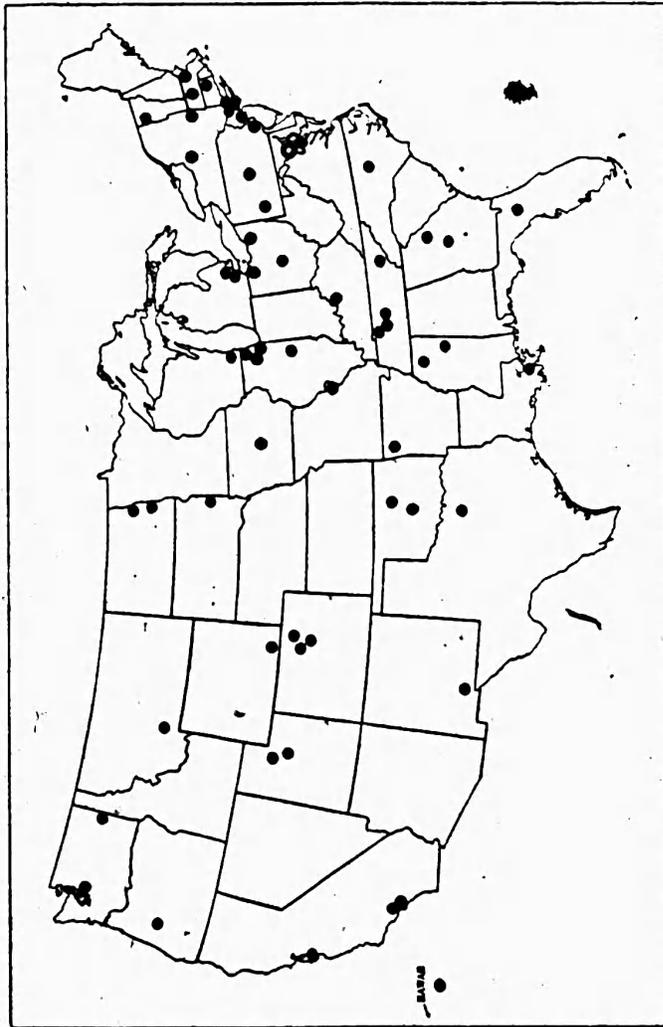
University E

Finance and banking.....	\$570.86	Natural sciences.....	\$1,219.64
Foreign languages.....	836.00	Pharmacy.....	1,508.36
Law.....	1,068.60	Social sciences.....	723.24

University F

Banking.....	\$1,160.16	Music.....	\$1,410.95
Economics.....	1,324.02	Civil engineering.....	2,506.26
Journalism.....	1,248.92	Electrical engineering.....	2,290.53
Law.....	1,117.77	Mechanical engineering.....	2,611.25

Special attention must be called to the fact that an element of invalidity entered into the computation of the costs for curriculums. The reason for this is that the costs were computed on a basis of the costs per student-credit-hour for the departments during the current year only, rather than on such costs for each year covering the 4-year period of the curriculum. Departmental costs vary from year to year dependent on the number of students registered and the amount of expenditures for the department. These costs for curriculums, therefore, should be regarded as approximate rather than absolute costs.



Location of the institutions participating in the Project in Research in Universities