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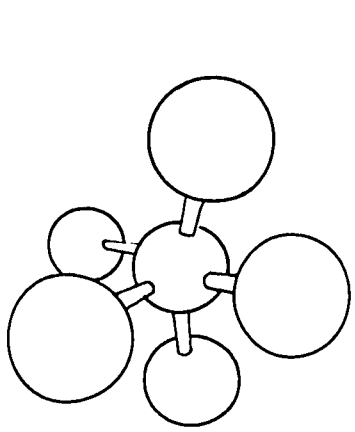
ABSTRACT

This paper discusses some of the problems in estimating enrollments and expenditures of the educational establishment. Topics included in the outlook for education to 1975 include: (1) projections of school and college enrollments, (2) supply of and demand for elementary and secondary school teachers, (3) supply of and demand for instructional staff in higher education, (4) analysis of educational expenditures, and (5) projected educational expenditures. (RA)

OE–10051

EDUCATION in the SEVENTIES



Planning Papers of the
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Planning Paper 68–1

U.S. Department of Health, Education, and Welfare

Wilbur J. Cohen, *Acting Secretary*

Office of Education

Harold Howe II, *Commissioner*

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Preface

The following planning papers were prepared by the Office of Program Planning and Evaluation, U.S. Office of Education, to stimulate discussion about the needs for education in the 1970's. The papers do not represent policy statements by the Office of Education. They are merely contributions to policy discussions which were found useful internally and which may be useful to others interested in quantitative information in policymaking. As we learn more about the structure of education and new issues are brought to our attention, these projections will be revised.

We hope to continue sharing the results of our studies as they become available.

JOSEPH FROOMKIN
Assistant Commissioner for
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U.S. Office of Education.

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1. The Outlook for Education to 1975

It has often been said that American education is in a state of constant crisis. In the 1950's we experienced the crisis of quality, and during the 1960's we have been weathering the crisis of increasing enrollments. It is very likely that in the 1970's we shall face the crisis of equalizing educational attainment. The makings of this crisis are already upon us.

ENROLLMENTS

Education has always been a growth industry in the United States. Since the turn of the century enrollments in kindergarten through grade 12 nearly tripled, from 17 million students in 1899–1900 to 49 million in 1965–66. During the same period of time, degree-credit enrollment in institutions of higher learning increased 35 times, from 156,000 to 5½ million.

The recent enrollment crisis, roughly between 1955 and 1965, was caused primarily by increasing enrollments at the high school and college levels. The rate of increase in enrollments in elementary school held fairly constant between 1945 and 1965. Total enrollments increased roughly 40 percent during each decade. In absolute numbers the increases were 11 million between 1945 and 1955 and 16 million between 1955 and 1965.

This increase in enrollments is very likely to taper off during the next decade. If other things remain equal and fertility levels remain low, fall enrollments are quite likely to be about 5.1 million higher in 1970 than in 1965 and they will probably increase only an additional 1.1 million between 1970 and 1975 (see table 1).[1]

This slow growth in total enrollments and the relatively stable or declining elementary school enrollments (grades kindergarten through 8) raise the issue of what we can afford to do (1) to fight school dropouts and (2) to increase enrollments below first grade in order to prevent disadvantaged youngsters' retardation in school.

Currently, about 29 percent of those entering the fifth grade drop out before graduation. If present trends continue, this rate is expected to decrease to 25 percent of fifth-grade enrollments by 1970 and 22 percent by 1975. If all potential dropouts stayed in school and graduated from the 12th grade, enrollments would be increased by about 900,000 in both 1970 and 1975. Not only will the dropout rate decrease, but it is very likely that non-high school graduates will leave school later. Perhaps as many as 50 percent of all dropouts in 1975 will leave school in the 12th grade.

Dropouts do not happen overnight: They are generally the result of cumulative retardation. In 1960, for instance, 37 percent of the children between the ages of 10 and 13 from poor and uneducated families (parents' income less than $3,000 and education less than high school graduation) were in grades below the mode for their age. Only 4 percent of children from more prosperous and well educated families were below the modal grade. By age 18 and 19, two-thirds of poor children enrolled in school are still trying to finish high school, as contrasted to fewer than one in six of the children of richer families.

There are indications that such retardation is cumulative and that it is beginning even before most children start attending regular school. In the past decade enrollments in kindergarten and nursery schools increased quite rapidly. According to the U.S. Census Bureau, 3.4 million children were enrolled in nursery school and kindergarten in 1965. If present trends continue, one can expect these enrollments to increase to 3.6 million by 1970 and 4.9 million in 1975.

TABLE 1.—*Estimated (1965) and projected (1970 and 1975) fall enrollment by level*

[In millions]

Level	1965	1970	1975
Total	54.3	59.4	60.5
Elementary	35.9	37.1	35.1
Secondary	12.9	15.0	16.3
Higher education [1]	5.5	7.3	9.1

[1] Degree credit.

[1] For the alternative range of projections, see Joseph Froomkin and Joseph Brackett, *Projections of School and College Enrollments: 1970 and 1975*, ch. 2, p. 7.

A high proportion of the children enrolled will come from the more prosperous families.

Alternatively, pre-first grade enrollments could be stimulated to provide universal kindergarten training for most 5-year-old children by 1970, to provide nursery schools for the same proportion of 4-year-olds as are now enrolled in kindergarten, and to raise the proportion of 3-year-olds in nursery schools to the level reached by 4-year-olds in 1965; this would raise enrollments by 2.8 million in 1970. Similarly by 1975, with practically universal enrollment of 4-year-olds in nursery school and 5-year-olds in kindergarten, and 61 percent enrollment of 3-year-olds (the kindergarten rate for 5-year-olds in the mid-1960's) in nursery school, enrollments would increase by 5.3 million over the trend projection.

Thus it is quite possible that preelementary school enrollments will account for nearly all the growth in enrollments between 1965 and 1975 (see table 2).

TABLE 2.—*An alternative projection of school enrollments*
[In millions]

Level	1965	1970	1975
Total	48.8	54.9	56.7
Pre-first grade	3.4	6.4	10.2
Elementary (1–8)	32.5	33.5	30.2
Secondary (9–12)	12.9	15.0	16.3

A short comment may be in order about enrollment in institutions of higher education. About half of the Nation's high school graduates are admitted to degree-credit programs at institutions of higher education. A steadily increasing percentage of these first-time students is enrolling in junior colleges. Projections indicate that by 1975, 30 percent of all first-time enrollees will be in 2-year institutions.

It is interesting to note that if enrollments in higher education were not affected by the socioeconomic status of parents, as many as 75 percent of all high school graduates would enroll in college. In other words, if the financial constraints of the children of the less affluent and the less well-educated were the same as those of the upper quartile of the U.S. population, first-year enrollments in college would be 25 percent higher in 1975.

SUPPLY OF TEACHERS

The opportunities for education in the United States, to say nothing about its quality, are dependent to a large extent upon the availability of personnel to man the educational establishment. Teachers can be grouped roughly in two categories: (1) Elementary and secondary teachers, and (2) college teachers.

The supply of elementary and secondary school teachers is expected to increase from 1.5 million in 1960 to 2 million in 1965, to 2.2 million in 1970, and 2.9 million in 1975. These projections are based not on the demand for teachers but rather on the supply. In other words, these figures were determined with the help of a model which took into account (*a*) the turnover and retirement rates for teachers who are already qualified, (*b*) the number of new teachers who are likely to earn degrees between now and 1975, and (*c*) the in-and-out movement of women teachers as they enter and leave the working force to raise families. The projections are based on the 1950–60 experience. They approximate actual 1965 numbers fairly accurately.[2]

The figures cited in the paragraph above refer solely to teacher supply. Unless there is money (and desire) to employ the teachers and unless the teachers have the appropriate training to fill the specific jobs available, there is no guarantee that they will be employed. It was assumed that 250,000 teachers would be employed by private schools in 1970 and 330,000 in 1975. For the remainder, if no attempt is made to improve the student/teacher ratio, only 1.8 of the 2.5 million available teachers will be employed in 1975. Under such circumstances there will be a surplus of 700,000 teachers in 1975. Similarly, if the student/teacher ratio in public schools does not change by 1970, we believe there will be some 300,000 surplus teachers at that time.[3] On the other hand, we already have some evidence of a declining student/teacher ratio in the elementary schools.

Despite this projected supply of teachers, by 1970 there will still be too few teachers to reduce class size to 20 students in elementary school and 25 students in high school (actually the ratio of students/teachers would be 18 to 1 for that class size since high school teachers teach less than a full day). In 1970, the Nation is very likely to be 400,000 teachers short of these objectives; in 1975, it may achieve these objectives and still have 200,000 teachers for other tasks.

[2] See Howard C. Vincent, *Supply and Demand of Elementary and Secondary School Teachers,* Ch. 3, p. 11.

[3] In another study, the U.S. Department of Labor forecast a surplus of 21,000 teachers a year between 1965 and 1970. Maxine A. Stewart, "A New Look at Manpower Needs in Teaching," U.S. Department of Labor, *Occupational Outlook Quarterly,* vol 8, No. 2, May 1964, p. 10.

There will not be enough elementary school teachers to support increasing prekindergarten enrollments and also reduce class size by 1970. In 1970, to follow the model in table 2, we will need 140,000 teachers for the additional preschool enrollments. Only 60,000 teachers would then be available to reduce class size.

By 1975, there will be enough teachers to reach the optimum class size and also enroll all preelementary students included in the model. In other words, the 240,000 teachers needed to reduce class size and the 260,000 required for additional preelementary education will then be available.

Our assumptions about class size in preelementary education are on the high side. In all probability, if the supply of teachers is tight and if preelementary enrollments increase, subprofessional aides will be needed not only in preelementary education but also in the first three grades of school. Assuming that, for one-third of the students enrolled, one subprofessional aide is provided for every teacher below first grade and one such aide for every two teachers in grades one to three, 200,000 aides would be required in 1970 and 252,000 in 1975.

The supply situation is not so encouraging at the higher education level as at the lower. Even if, in line with past trends, 18 percent of the population holding master's or higher degrees goes into teaching, the student/faculty ratio will deteriorate from 14.2/1 in 1964 to 15.6/1 in 1970. By 1975, if a low enrollment estimate holds, the ratio will have improved to approximately the 1964 ratio. The ratio of Ph. D.'s to total faculty, 50 percent in 1964, is quite likely to be 43.5 percent in 1970 and 46 percent in 1975. Depending upon the demands of research in the future, this situation may be alleviated or aggravated. A desirable ratio of Ph. D.'s to total faculty is 50 percent, with faculty/student ratios of 10.1/1.

PAST TRENDS IN EXPENDITURES [4]

Total outlays for education, public and private at all levels, increased 167 percent between 1955–56 and 1965–66. For the public sector, excluding private outlays, the increase during that decade was 158 percent. Total public and private school outlay, in current dollars, was $16.7 billion in 1956 and $44.5 billion in 1966. Public sector outlays grew from $13.5 billion to $34.8 billion. Roughly half the increase was caused by rising costs, the rest by higher enrollments and improved services.

During this time period the shares of Federal, State, and local governments in meeting the costs of public elementary and secondary and all higher education changed quite noticeably. The share of the Federal Government increased from 7 percent in 1956 to 14 percent in 1966. The States contributed 32 percent in 1956 and 33 percent in 1966. Local government's share was 46 percent in 1956 and 35 percent in 1966. The contribution of the private sector to higher education was more than 14 percent in 1965 and almost 18 percent in 1966.[5]

The highlights, by level of education, were as follows:

1. *Public Elementary and Secondary Education* outlays increased by 132 percent from $11.2 billion to $25.9 billion between 1956 and 1966. During that time:
   a. The Federal Government's share increased from 4 to 8 percent.
   b. The State government's share increased from 33 to almost 38 percent.
   c. Local government's share decreased from 63 to 55 percent.
2. *State Department of Education* outlays increased by 197 percent, growing from $57 million to $169 million between 1956 and 1966. In that period:
   a. The Federal contribution increased from 5 to 37 percent of the total.
   b. The States' share declined from 95 to 63 percent of the total.
3. In *Higher Education,* total expenditures grew 258 percent in the 10 years following 1956. Expenditures totaled $4 billion in 1956 and $15 billion in 1966. The changes in financing were:
   a. The Federal Government increased its contribution from 16 to 24 percent.
   b. The States contributed 28 percent of the total in 1956 and 25 percent in 1966.
   c. Local governments furnished an almost constant percentage of the outlays, about 3 percent.
   d. The contribution of the private sector declined from 54 to 49 percent.

In elementary and secondary education, teacher salaries continued to claim the lion's share of the total, some 60 percent of current expenditures. This item of expenditure grew at the rate of 148 percent com-

[4] For details on expenditure trends, see Penrose B. Jackson, *An Analysis of Expenditures in Education,* Ch. 5, p. 23.

[5] Includes income from tuition and fees, charges for services, endowment income, investment earnings, and gifts.

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pared to a 132 percent growth rate in total outlays during the decade 1955 to 1966. Other items which grew somewhat faster were (*a*) administration, 179 percent; (*b*) other instructional costs, 207 percent; and (*c*) other current expenditures, 443 percent. The last two categories, other instructional costs and other current expenditures, were quite heavily subsidized by the Federal Government, which paid 24 percent of the bill in 1966. Twenty-six percent of the total of other instructional costs, which include outlays for textbooks and school library books, was paid by the Federal Government. Expenditures for all books probably increased fourfold during the period, and expenditures for supplies and the like grew 252 percent. In the case of item (*c*), other current expenditures, the Federal Government underwrote slightly less than 24 percent of the bill in 1966, primarily for summer school and adult training programs.

Outlays of State departments of education (which under current legislation have the responsibility for administering a number of key programs) grew threefold during the past 10 years. These funds still amounted to less than one-half of 1 percent of total public outlays for education.

In higher education, the Federal Government increased its expenditures 434 percent between 1956 and 1966, from $655 million to $3.5 billion. Practically identical growth rates were observed in current and plant outlays. The most dramatic increase in Federal expenditures occurred in subsidizing outlays for "student education." Federal money for that purpose increased sevenfold. In organized research, which accounted for 55 percent of the Federal outlay in 1966 and 54 percent in 1956, the Federal share grew from 65 percent to 77 percent of the total.

While the Federal and State Governments increased their support for current costs of higher education at slightly higher rates than for capital costs, private funds became more heavily committed to capital outlays. For instance, during the past 10 years private sources increased their expenditures for capital plant 265 percent as contrasted to 218 percent for current outlays.

If one were to summarize current developments in expenditures for education, one would be impressed by (1) the increasing share of total expenditures shouldered by the Federal sector, and (2) the concurrent increase in capital outlays. In other words, as the pressure on current funds was alleviated by Federal subsidies, buildings grew.

PROJECTIONS OF EDUCATIONAL EXPENDITURES: 1970 AND 1975

Current Funds

The range of estimates of future expenditures for education is quite wide. For instance, the U.S. Office of Education, National Center for Educational Statistics, projects current outlays for education at $56.7 billion for 1970 and $76.4 billion for 1975.[6] Leonard A. Lecht in his study of *Goals, Priorities, and Dollars,*[7] estimates that $58.1 billion in 1962 dollars will be necessary to meet the "aspiration standards" of this country in 1970 and $77.5 billion in 1962 dollars in 1975. In 1966 dollars the amounts would be roughly 12 to 14 percent more. The Tax Foundation, on the other hand, projects State and local outlays for public education at $41.5 billion in 1970 and $52.9 billion in 1975 in current prices.[8]

These estimates are not strictly comparable. They are based on somewhat different predictions about enrollments and other developments. The National Center for Educational Statistics projects trends; the Tax Foundation considers only State and local expenditures; and Lecht assumes an ideal world.

The cost projections for 1970 and 1975 in this paper are in current rather than in constant 1966 dollars. Productivity in education has remained fairly constant, with costs per student increasing considerably faster than the price level as teachers' salaries have been raised to keep pace with other salaries.

The projections in this paper are based upon the past few years' developments in teaching costs. It is assumed that elementary and secondary teachers' salaries will rise at 5 percent a year, somewhat more slowly than hitherto (they rose at the rate of 5.2 percent in the decade 1956–66) because of the decreasing shortage of teachers, and that salaries for higher education instructional staff will increase 6.2 percent a year in the period 1965–70 and 5.5 percent after 1970 to reflect demand conditions.

If we postulate that the pupil/teacher ratio in the elementary and secondary schools will remain at the present level and the trend in teacher salaries will continue, we can place expenditures for instructional

[6] Kenneth A. Simon and C. G. Lind, "Expenditures for Educational Institutions," U.S. Office of Education, National Center for Educational Statistics, unpublished data.

[7] A National Planning Association study published by the Free Press, New York, 1966.

[8] In *Fiscal Outlook for State and Local Government to 1975,* Tax Foundation, Inc., New York, 1966.

salaries at $16.4 billion in 1970 and $21 billion in 1975. Total current outlays would then be $31.6 billion in 1970 and $38.8 billion in 1975. If, on the other hand, preschool enrollments increase and a more favorable pupil/teacher ratio is achieved, expenditures for instructional salaries may reach $22.7 billion in 1970 and $30.1 billion in 1975. Total current outlays would then be $39.9 billion and $51.5 billion in 1970 and 1975.[9] This assumes the availability of teachers in 1970 to reduce class size. With a more limited supply, additional teacher aides might be utilized, with the projected expenditure at roughly the same level.[10]

In higher education a continuation of the trend in student/faculty ratios and in salary levels as described above would result in current outlays of $18 billion in 1970 and $28 billion in 1975 with the low enrollment projection and $19 and $30 billion with the higher enrollment projection.

If we arbitrarily assume that outlays for State departments of education will follow past trends and will rise 50 percent every 5 years, they would then be $250 million in 1970 and $375 million in 1975.

Capital Funds

While current outlays are likely to increase quite rapidly during the next 10 years, there is a good probability that capital outlays will remain fairly stable and may even decline somewhat from the 1965–66 peak. It should be remembered that construction outlays increased by $1.4 billion to a rate of $3.8 billion a year in public elementary and secondary education, or more than 50 percent, during the period 1955–65; in higher education they grew fourfold during the same period, rising to a $3 billion annual rate during the decade.

If pre-first grade enrollments are not stepped up, construction at the 1965–66 rate of almost 70,000 rooms a year should substantially alleviate substandard and overcrowded rooms in public schools. These classrooms are likely to cost $3.5 billion a year. If, on the other hand, a concerted drive is made to enroll preschoolers, an additional 20,000 to 25,000 classrooms a year for preschool children, costing from $1 to $1.2 billion, may be needed in the period 1970 through 1975. These costs may be low by a factor of 20 percent since they do not reflect future increases in construction costs. During the past 10 years, construction costs per classroom remained stable in the face of rising costs; there are indications that this trend will continue.

In higher education the deficit in space of the early 1960's seems to have been partly met. If 150 square feet of space per student is required it is probable that a $2.5 billion level will be sufficient to keep higher education facilities up to this standard.

THE FISCAL OUTLOOK

The possible range of current expenditures for public elementary and secondary education is from $31.6 billion to $40 billion in 1970–71 and from $39 to $52 billion in 1975–76. These estimates are much higher than projections of the Tax Foundation,[11] which places current outlays at $27 and $35 billion in 1970 and 1975. Current outlays of higher education may range from $18 to $20 billion and from $28 to $33 billion in the same time periods. At least a third of these resources will come from State and local taxes. Thus, the total bill for current operations of public schools and public and private institutions of higher education will be from $50 to $61 billion in 1970 and from $68 to $84 billion in 1975 (see table 3).

The need for capital funds may be estimated at close to $6 billion in 1970 and between $6 and $7 billion in 1975, of which from one-half to two-thirds will be financed locally if past trends continue. This compares to the Tax Foundation estimates of $5.7 and $5.1 billion State and local expenditures for these two periods. Private college expenditures are not included in its estimates.

Some general observations from these projections may be stated:

1. Federal support for educational facilities will not be as necessary in the next decade as in the past decade unless new concepts in schooling (such as those dealing with preelementary programs or educational parks) are encouraged.
2. In the period 1970–75, local authorities may be less willing than formerly to finance reductions in class size. Federal aid to school operations may have to be increased during that period.
3. Considerable attention must be paid to the interrelation of Federal research programs and the supply of college teachers.

[9] See Penrose Jackson, *Educational Expenditures in the Seventies*, ch. 6, p. 39.

[10] A deterioration in faculty/student ratios in 1970 and a slight improvement by 1975 are considered in the cost projections.

[11] In *Fiscal Outlook for State and Local Government to 1975*, Tax Foundation, Inc., New York, 1966. The projections cited are based on continuation of 1959–64 rise in per pupil costs and do not take explicit account of possible additive effects of grants under the Elementary and Secondary Act of 1965.

TABLE 3.—*Education outlays*

[In billions of current dollars]

Expenditures	1955–56	1965–66	1970–71 A	1970–71 B	1975–76 A	1975–76 B
PRESENT STUDENT/TEACHER RATIOS [1]						
Current funds	11.7	33.5	50.2	53.3	67.7	73.6
Public elementary/secondary	8.3	21.3	31.6	33.7	38.8	43.3
State administration	.1	.2	.3	.3	.4	.4
Higher education [2]	3.3	12.0	18.3	19.3	28.5	29.9
Capital funds	3.4	7.6	6.0	6.0	6.0	7.0
Public elementary/secondary	2.6	3.8	3.5	3.5	3.5	4.5
Higher education [2]	.8	3.8	2.5	2.5	2.5	2.5
IMPROVED STUDENT/TEACHER RATIOS [3]						
Current funds	11.7	33.5	.....	60.7	.....	84.5
Public elementary/secondary	8.3	21.3	.....	39.9	.....	51.5
State administration	.1	.2	.....	.3	.....	.4
Higher education [2]	3.3	12.0	.....	20.5	.....	32.6
Capital funds	3.4	7.6	.....	6.0	.....	7.0
Public elementary/secondary	2.6	3.8	.....	3.5	.....	4.5
Higher education [2]	.8	3.8	.....	2.5	.....	2.5

[1] Assumes continuation of present pupil/teacher ratios in elementary and secondary schools; in higher education, assumes continuation of trend toward higher student/faculty ratio.

[2] Public and private.

[3] Assumes a 20 to 1 pupil/teacher ratio in elementary and secondary schools and improvement in student/faculty ratios in higher education to 1959 level.

NOTE: Col. A refers to low enrollment and col. B refers to high enrollment projections. Enrollment projections are discussed in detail in ch. 2.

2. Projections of School and College Enrollments: 1970 and 1975*

The future costs of formal education in America depend largely on future enrollments. Most of the students who will attend school in 1975 have already been born. Hence, one would expect projections of school and college enrollments for 1970 and 1975, notably those published by the National Center for Educational Statistics (NCES), U.S. Office of Education, and the Population Division, U.S. Bureau of the Census, to be fairly similar. In general, these projections indicate that the increase in enrollments from 1965 to 1975 will be only about half as much as the increase which occurred from 1955 to 1965. The percentage increase during this period will be about one-third that of the preceding decade. However, the projections differ by as much as 1.2 million for enrollments in 1970 and 3.2 million for 1975.[12]

Rising enrollments were one of the principal causes of pressure on the educational system during the past 20 years. Between 1945 and 1965 total enrollments doubled; in higher education enrollments increased more than five times (see table 4).

This report presents an analysis of existing projections for 1970 and 1975, examines the assumptions underlying the projections, and discusses the policy implications of different levels of enrollment. In addition, alternative estimates of nursery and kindergarten enrollments prepared by the Office of Program Planning and Evaluation are presented.

TABLE 4.—*Total enrollments by grade level: 1945–65*
[Thousands of students]

Level	1945	1950	1955	1960	1965
Total, all levels	26,780	31,304	37,941	45,764	54,299
K–8	19,612	22,693	27,717	32,492	35,863
9–12	6,093	6,324	7,563	9,689	12,910
Higher education [1]	1,075	2,287	2,661	3,583	5,526

[1] Degree credit.

Source: *Digest of Educational Statistics and Projections of Educational Statistics*, series of the U.S. Office of Education.

ENROLLMENT PROJECTIONS

As shown in table 5, total enrollments as projected by the Office of Education are expected to increase from 54.3 million in 1965 to 59.4 million in 1970 and 61.2 million in 1975. The U.S. Bureau of the Census places estimated enrollments at 58.2 to 58.9 million in 1970, and 58 to 61.9 million in 1975.

NCES.—The U.S. Office of Education enrollment estimates are based on the U.S. Census "C" projection, which assumes that the fertility rates will continue at the 1966 level. It further assumes increasing enrollment rates in kindergarten through grade two and increasing retention rates in grades three through 12, based upon 1955–65 trends, as well as continuation of the 1955–65 trend in college attendance through 1975.[13] In preparing estimates of enrollment, statisticians in the U.S. Office of Education generally apply these projected trends to students grouped by various education levels such as primary or secondary.

Census.—The U.S. Bureau of the Census bases its series of population projections, A, B, C, and D, upon

[12] This comparison exaggerates the real differences, since NCES uses a projection base between the low and high base of Census. The enrollment data for 1966, however, illustrate the substantial differences that are reflected in the projections:

	Enrollment (in thousands)			
	Total	K–8	9–12	College
NCES	55,502	36,357	13,198	5,947
Census	55,070	35,624	13,364	6,085

[13] The trend projection is modified by the addition of 17,000 students per year supported under the veterans' education benefit program.

*Prepared by Joseph Froomkin and Joseph Brackett, Office of Program Planning and Evaluation, U.S. Office of Education.

a range of assumptions regarding future fertility rates. The highest of these, Series A, assumes a continuation of the average annual level of age-specific fertility of the past 4 years into the future. Series B assumes a moderate decline from this level; Series C, a continuation of the fertility rate of 1966; and Series D, a decline to the level of the early forties.

Census estimates of enrollment are derived by multiplying projected enrollment rates by the projected number of persons by single years of age and sex. Census prepares two series of enrollment projections based on the Series B and D population projections. Series 1 assumes that the increasing trend of enrollments by single years of age observed from 1950–52 to 1963–65 will continue. Series 2 was derived by averaging the Series 1 enrollment rates and the rate observed in 1965. The results of these projections are compared with NCES estimates in table 5.

TABLE 5.—*Total enrollments in 1970 and 1975* [1]

[Millions of students]

Source of data	1955	1965	1970	1975
NCES	37.9	54.3	59.4	61.2
U.S. Census	37.4	53.8	.....	.....
High fertility/high attendance			58.9	61.9
High fertility/low attendance			58.2	60.4
Low fertility/high attendance			58.9	59.4
Low fertility/low attendance			58.2	58.0

NOTE: Differences between the estimates for 1955 and 1965 by the 2 agencies reflect differences in their data sources and coverage. The census series utilizes data obtained by a sample of households; the NCES data are furnished by State and local educational agencies. The census excludes students under 5 and over 34 years of age; the NCES covers all age groups.

[1] Includes degree-credit enrollments only in institutions of higher education.

Sources: NCES data from work sheets for the 1967 edition of the *Projections of Educational Statistics*. Census data from Current Population Reports, Series P-25, No. 365, May 5, 1967, *Revised Projections of School and College Enrollment in the United States to 1985.*

Comparison of NCES and Census Projections.—The difference between NCES and Census projections can be explained by differences in estimating methods used. The lion's share of the difference in published estimates must be laid to different assumptions about future births and to differences in coverage of both series:

1. NCES enrollment projections are based on the Census Series C population projection, whereas Census enrollment projections are based on its Series B and D projections.
2. Census estimates are limited to enrollment of persons between 5 and 34 years of age and NCES estimates include total enrollments of all ages.
3. NCES projections are based on the total population, and Census excludes the military.

These factors serve to increase NCES estimates compared to those of the U.S. Census. Nevertheless, the direction and magnitude of anticipated enrollment changes are consistent—the Census Bureau Series B enrollment projection shows a sizable increase in elementary and secondary enrollments from 1970 to 1975, and the Series D projection shows a sizable decrease. NCES, using the Census "C" population projection, shows a slight decrease in expected enrollments.

A careful examination of present population trends, as well as trends in enrollment, leads us to favor the intermediate U.S. Census population projection (Series C) and the high enrollment trend (Series 1) as probably accurate in depicting future events, but we prefer a somewhat less conservative estimate that provides for some decline in the fertility rate from that of 1966. Population projections, of course, only effect the enrollment projections for 1975, since children of school age in 1970 have already been born. Our estimates of enrollment in 1975, somewhat lower than the NCES projection, appear in table 6.

The projections of elementary (K–8) and secondary (9–12) enrollments by the National Center for Educational Statistics and the Office of Program Planning and Evaluation (OPPE) are compared in table 6.

TABLE 6.—*Enrollment projections, elementary and secondary schools: 1970 and 1975*

[Millions of students]

Level	1965		1970		1975	
	NCES	Census	NCES	OPPE	NCES	OPPE
Elementary	35.9	35.1	37.1	37.1	35.5	35.1
Secondary	12.9	13.0	15.0	15.0	16.6	16.3
Total	48.8	48.1	52.1	52.1	52.1	51.4

OE and Census projections of enrollment at the high school level do not differ drastically. NCES estimates 300,000 more high school students in 1975 than Census. The difference between these estimates is less than 2 percent of total enrollment. For the elementary school population, Census estimates of enrollment range from 33.7 million to 36.1 million, and NCES estimates 35.5 million.

If births per 1,000 women stay at their present level, primary and secondary enrollment in 1975 will probably be about 52 million. If births decline, as we assume in the OPPE projection, enrollment would be almost a million less.

DROPOUT RATES

Given present trends in the rate of enrollment and school graduation, the high school dropout problem should be less severe in the next 10 years. During the past 20 years, dropout rates decreased considerably, from 65 percent of students entering fifth grade to 29 percent. In the past 10 years alone, the high school dropout rate declined by 16 percent.

Retention rates on which projections of high school enrollment are based assume that the dropout rate will further decline to 25 percent by 1970 and 22 percent by 1975. Furthermore, over one-third of the dropouts in 1970 and one-half in 1975 are assumed to be persons who have attended the 12th grade but who fail to graduate from high school. The percentage of those entering 12th grade and failing to graduate has been increasing slowly, from 4.1 percent in 1955 to 7.4 percent in 1965. It is expected to grow to 9.2 percent in 1970 and 12.4 percent in 1975.

In absolute terms, 950,000 students (25 percent of the estimated fifth-grade enrollment in 1963) who could graduate in 1970 are not expected to finish high school. About 900,000 (22 percent of the estimated fifth-grade enrollment in 1968) who could graduate in 1975 are not expected to finish.

PRE-FIRST GRADE SCHOOL POPULATION

Elementary school enrollments are likely to be almost a million less in 1975 than in 1965. The vacant classrooms could thus permit higher rates of enrollment for younger children without great strain on capital funds.

The total out-of-school population 5 through 17 is quite likely to decline from 2.4 million in 1965 to 2 million in 1970 and 1.8 million in 1975 (see table 7).

TABLE 7.—*Out-of-school population aged 5–17*

[In millions]

Age	1965	1970	1975
Total, 5 to 17	2.4	2.0	1.8
5	1.3	1.0	1.0
6			
7 to 13	.1	.2	.1
14 to 17	1.0	.8	.7

Source: U.S. Census data.

By contrast, large numbers of 3- and 4-year-olds will still be out of school. If present trends (a tenuous projection based on 1964–65 enrollments) continue, we are likely to have a third of the 3- to 5-year-olds in school by 1970 and possibly 40 percent in 1975, as compared to over one-quarter today. Most of these children will be children from families in the higher income groups.

If, on the other hand, a concerted program were mounted to make public kindergarten compulsory and to provide voluntary programs for 4-year-olds and 3-year-olds, even with the medium birth rate projection we could very well increase the school population by over 5 million in 1975 (see table 8). In effect, probably well over a million more 5-year-olds, 3 million 4-year-olds, and 800,000 3-year-olds would be added to the rolls. This assumes that practically all of the 4- and 5-year-olds and more than half of the 3-year-olds would be in school by 1975. An alternative projection assuming that virtually all 3- through 5-year-olds will be in school would increase enrollments by nearly 7.4 million between 1965 and 1975.

TABLE 8.—*An alternative projection of elementary and secondary enrollments*

[Millions of students]

Level	1965	1970	1975
Pre-first grade	3.4	6.4	10.2
Elementary (1–8)	32.5	33.5	30.2
Secondary (9–12)	12.9	15.0	16.3
Total	48.8	54.9	56.7

HIGHER EDUCATION

Enrollments in higher education, which doubled between 1954 and 1964 and increased another 20 percent in the following 2 years, are likely to continue to grow substantially in the next 10 years (see table 9).

The growth in absolute numbers between 1965 and 1975 may be close to 3.5 million full-time equivalent students, according to the highest estimate, compared to 2.3 million in the previous decade. Percentagewise, the growth will be more moderate: 69 percent with a medium projection and 78 percent with the highest estimate in the 1965–75 decade, compared to over 109 percent in the previous decade.

The total enrollment in postsecondary institutions will probably consist of slightly over 50 percent of high school graduates enrolled in 4-year academic institutions and a large but not easily determined proportion enrolled in 2-year institutions. Office of Education projections are based on the assumption that 60 percent of all high school graduates will enroll in college by 1975. Underlying this assumption is the fact that over 1.5 million spaces will be available in 2-year institutions. In other words, it is assumed that enrollments in junior colleges will almost double between 1965 and 1975. If college admission standards do not change and the same proportion of students from lower income groups enroll in college as that from the highest quartile of the socioeconomic ladder, first-year fall enrollments may go up to 75 percent of the graduating high school class. (See *Project Talent—One-Year Follow-Up Studies*, School of Education, University of Pittsburgh, 1966, table 5–3, p. 96.)

In its turn, OPPE prepared alternative enrollment estimates (*a*) based on the assumption that the present attendance pattern by socioeconomic composition of the student population will continue, and (*b*) based on the assumption that the financial causes limiting the enrollment of students from lower socioeconomic groups will be eliminated (see table 9).

TABLE 9.—*Total and full-time equivalent fall enrollments in higher education: 1955 and 1965, with projections to 1970 and 1975*

[In thousands]

Year	Total degree-credit enrollments,[1] NCES			Total enrollments, Census,[2] all institutions	Full-time equivalent enrollments (Degree credit)		
	All institutions	Undergraduate and first professional	Graduate school		NCES	OPPE [3]	
						A	B
1955.....	2, 660	2, 418	242	.....	2, 122	2, 122	2, 122
1965.....	5, 526	4, 945	582	5, 675	4, 443	4, 443	4, 443
1970.....	7, 296	6, 481	816	7, 424	5, 829	6, 240	6, 644
1975.....	9, 088	8, 002	1, 086	9, 459	7, 235	7, 515	7, 928

SOURCES

[1] U.S. Office of Education, NCES, *Projection of Educational Statistics to 1976-77* (in process).

[2] U.S. Bureau of Census, *Current Population Reports*, Series P-25, No. 365, May 5, 1967.

[3] U.S. Office of Education, Office of Program Planning and Evaluation

3. Supply and Demand of Elementary and Secondary School Teachers *

Various estimates have been made of the future supply of elementary and secondary school teachers. The National Center for Educational Statistics, for example, estimates that in 1970 there will be about 2.2 million elementary and secondary school teachers, with an increase to 2.4 million in 1975. However, these projections are based on assumptions concerning pupil/teacher ratios rather than the availability of teachers. For this reason the Office of Program Planning and Evaluation has estimated the supply of elementary and secondary teachers by analyzing the flow of teachers.

Our estimates are based on the age-sex distribution of teachers assuming certain turnover, retirement, and survival patterns. The results of these projections coincide with NCES estimates of 2.2 million teachers in 1970. However, our 1975 estimate of almost 2.9 million teachers varies considerably from the NCES estimate. The most apparent reason for this variation is that the OPPE estimate includes a large number of women teachers who are now raising families and will be returning to the teaching profession by 1975.

AGE-SEX CHARACTERISTICS OF TEACHERS IN 1960

A perspective of the supply of teachers and their immediate availability in the labor force can be gained by analyzing the demographic characteristics of this group in 1960. Some significant facts on the availability of teachers in 1960 are:

1. Almost 3 out of 4 teachers are women.
2. The majority of these women are 40 years of age or older.
3. Women who are professional teachers tend to drop out of teaching for a 10-year period between the ages of 25 to 35.
4. Women begin to return to the teaching profession between the ages of 35 and 39, but the peak returning ages are from 40 to 49.
5. The dropout rate for male teachers is high for those between the ages of 20 and 34; a significant number return to their profession before their 40th birthday, but the dropout rate prevails in the older age groups.

It is evident from this brief overview that women and their family status play a major role in determining the immediate availability of qualified teachers. We shall proceed with our analysis of demographic characteristics of teachers and derive projections of the supply for 1970 and 1975. In showing the age-sex structure of this segment of the labor force, we make certain assumptions about the entrance of beginning teachers, dropouts, retirements, and deaths. These assumptions are in line with observations of teachers during the 1950–60 period.

SUPPLY OF TEACHERS IN 1970 AND 1975

In constructing a model of the supply of future teachers, one must consider the structure of this group in the base year (1960) and the subsequent flows of beginning teachers, turnover rates, retirement, and mortality. The method employed here is as follows: (*a*) the number of teachers by age and sex in 1960 is carried forward to 1970 and then to 1975 by survival rates; (*b*) net turnover and retirement rates for teachers are estimated from the 1950 and 1960 census and applied to 1970 and 1975 projections; and (*c*) the number of beginning teachers from 1960 on is estimated from data on earned degrees and the proportion entering teaching careers. Details on these estimates are provided in the Technical Notes, page 15. The following are some of the significant points depicted by the projections (see table 10).

1. The supply of teachers in 1975 will be almost double that of 1960. This is due to a significant increase in the number of beginning teachers during the 15-year period and the large number of women teachers in the 25 to 35 age group in the 1960's who will have returned to the teaching profession by 1975.

**Prepared by Howard L. Vincent, Office of Program Planning and Evaluation, U.S. Office of Education.*

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TABLE 10.—*Number of elementary and secondary teachers by age and sex in the labor force (U.S. Census: 1960, Estimates 1970 and 1975)*

Supply of teachers in 1960				Supply of teachers in 1970				Supply of teachers in 1975			
Age	Total	Male	Female	Age	Total	Male	Female	Age	Total	Male	Female
20–24...	163, 400	34, 171	129, 229	20–24...	338, 089	75, 853	262, 231	20–24...	415, 645	93, 428	322, 217
25–29...	204, 771	85, 164	119, 607	25–29...	359, 977	129, 388	230, 589	25–29...	558, 184	166, 447	391, 737
30–34...	177, 407	80, 047	97, 360	30–34...	245, 372	108, 677	136, 695	30–34...	389, 171	158, 704	230, 467
35–39...	160, 079	61, 446	98, 633	35–39...	246, 324	107, 476	138, 848	35–39...	268, 915	121, 893	147, 022
40–44...	165, 264	41, 187	124, 077	40–44...	223, 616	77, 432	146, 184	40–44...	277, 658	104, 543	173, 115
45–49...	186, 338	36, 633	149, 705	45–49...	189, 254	53, 516	135, 738	45–49...	248, 632	72, 161	176, 471
50–54...	201, 560	34, 212	167, 348	50–54...	181, 554	34, 604	146, 950	50–54...	198, 616	48, 677	149, 939
55–59...	145, 070	24, 081	120, 989	55–59...	169, 830	28, 656	141, 174	55–59...	178, 540	30, 657	147, 883
60–64...	79, 206	13, 729	65, 477	60–64...	155, 330	23, 616	131, 714	60–64...	148, 877	23, 124	125, 753
65–69...	34, 100	5, 658	28, 442	65–69...	71, 022	11, 016	60, 006	65–69...	108, 320	15, 383	92, 937
70 and over...	13, 186	1, 873	11, 313	70 and over...	37, 965	6, 418	31, 547	70 and over...	61, 542	9, 128	52, 414
All.....	1, 530, 381	418, 201	1,112,180	All.....	2, 218, 333	656, 652	1,561,681	All.....	2, 854, 100	844, 145	2,009,955

2. Unless some special incentives are developed to attract men into teaching, the profession is likely to remain dominated by women.
3. Assuming that the retirement rates which prevailed in the 1950 to 1960 period continue, a significant number of teachers will be age 60 and over in 1975.
4. Even with the large increase in teachers, there will be more than 400,000 women teachers in the labor force reserve between the ages of 25 and 35 in 1970, with a similar situation in 1975.

ALTERNATIVE DEMANDS FOR PUBLIC SCHOOL TEACHERS, 1970 AND 1975

We will examine two models of the demand for public elementary and secondary school teachers. Model *A* will measure the demand for teachers from kindergarten through the 12th grade. Model *A′* will include pre-first grade children age 3 to 5. Both models will use a constant and optimum student/teacher ratio. Enrollment projections are shown in table 11,[14] and estimates of the supply of teachers in table 10.[15]

[14] Enrollment projections, adjusted to obtain a figure for enrollments in public schools, are based on tables 1 and 2 in ch. 1.

[15] Estimates of the supply of teachers for 1970 and 1975 were distributed between public and private elementary and secondary schools by past trends.

TABLE 11.—*Projections of public elementary and secondary enrollment, 1970 and 1975*

Year	Elementary	Secondary
MODEL A—(K–12)		
1970.....	31.1	13.5
1975.....	29.2	14.7
MODEL A′—(Pre-First—12)		
1970.....	33.9	13.5
1975.....	34.5	14.7

If we look at Model *A*, depicted in table 12, it is obvious that with a total supply of 2 million public school teachers in 1970 we will not be able to reduce the student/teacher ratio to an optimum size of 20 to 1 for elementary schools and 18 to 1 for secondary schools.[16] However, if we hold the student/teacher ratio constant for 1970, we will have an excess of 300,000 public school teachers. With these teachers we can either reduce the student/teacher ratio, increase pre-first-grade enrollments, or do some of both. In Model *A′*, which includes an additional 2.8 million pre-first-graders, we require an additional 100,000 teachers, assuming a constant student/teacher ratio

[16] The 18 to 1 student/teacher ratio for public secondary schools is based on an actual class size of 25 to 1.

TABLE 12.—*Supply and demand of public elementary and secondary teachers, 1970 and 1975 (Model A—Enrollment K–12)*

[In millions]

Year	Total			Elementary			Secondary		
	Supply [1]	Requirements		Supply	Requirements		Supply	Requirements	
		Constant S/T [2]	Optimum S/T [3]		Constant S/T [2]	Optimum S/T [3]		Constant S/T [2]	Optimum S/T [3]
1970	2.0	1.7	2.4	1.1	1.1	1.6	0.9	0.6	0.8
1975	2.5	1.8	2.3	1.3	1.1	1.5	1.2	.7	.8

[1] Estimates for supply of public elementary and secondary teachers are taken from table 10, page 12.

[2] Constant student/teacher ratio of 27.5 for elementary schools and 21.4 for secondary.

[3] Optimum student/teacher ratio of 20 for elementary schools and 18 for secondary.

(see table 13). The remaining 200,000 teachers can be used to reduce the student/teacher ratio (see chart 1 and chart 3).

In 1975 we have a more favorable situation in public education. As shown in Model *A'*, we will have enough teachers to achieve both of our goals. We can reduce the student/teacher ratio to an optimum level. At the same time we can increase the enrollment of

Chart 1—Estimates of the Supply of and Demand for Elementary Teachers—1970
(PUBLIC)

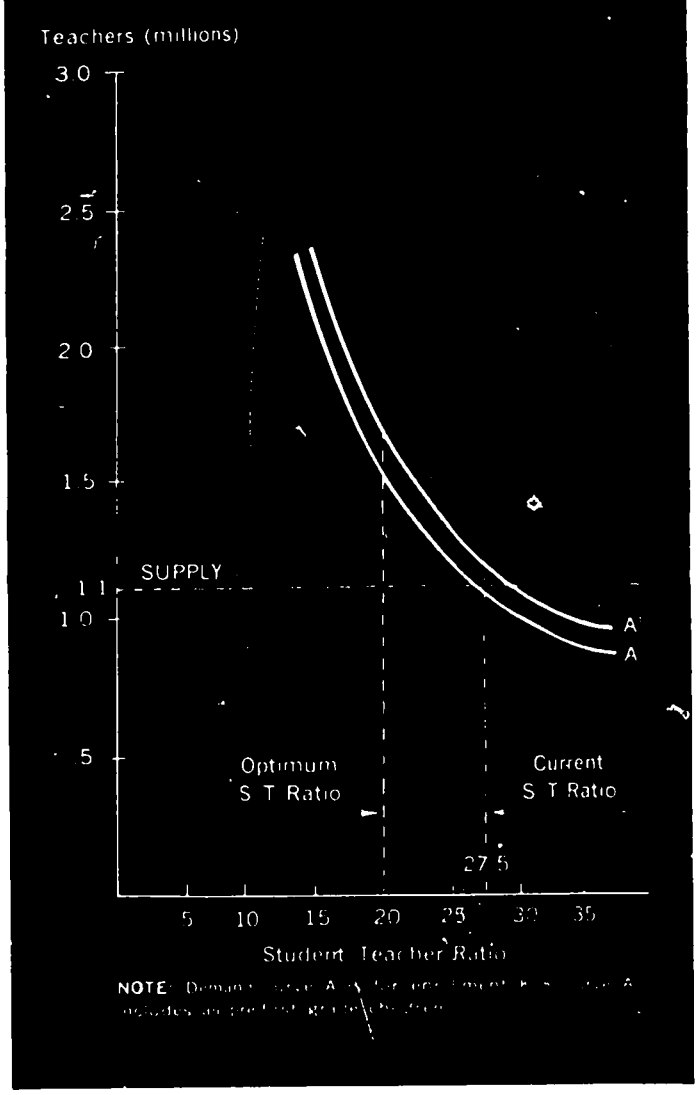


Chart 2—Estimates of the Supply of and Demand for Elementary Teachers—1975
(PUBLIC)

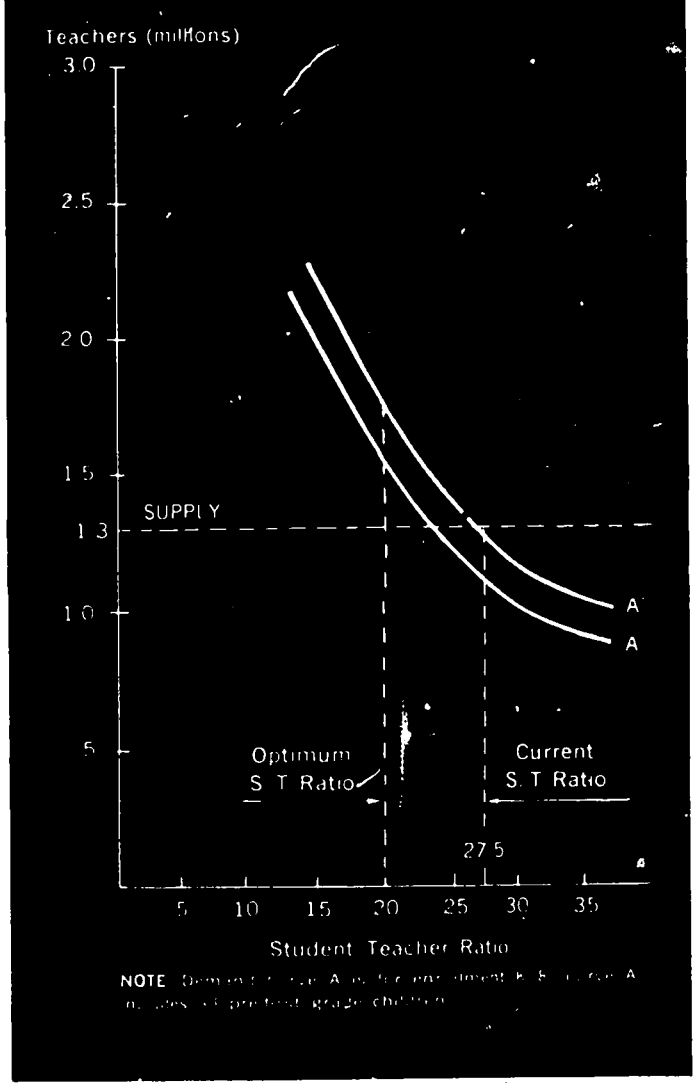


TABLE 13.—*Supply and demand of public elementary and secondary teachers, 1970 and 1975 (Model A'—Enrollment pre-first–12)*

[In millions]

Year	Total			Elementary			Secondary		
	Supply [1]	Requirements		Supply	Requirements		Supply	Requirements	
		Constant S/T [2]	Optimum S/T [3]		Constant S/T [2]	Optimum S/T [3]		Constant S/T [2]	Optimum S/T [3]
1970	2.0	1.8	2.5	1.1	1.2	1.7	0.9	0.6	0.8
1975	2.5	2.0	2.5	1.3	1.3	1.7	1.2	0.7	0.8

[1] Estimates for supply of public elementary and secondary teachers are taken from table 10, page 12.

[2] Constant student/teacher ratio of 27.5 for elementary schools and 21.4 for secondary.

[3] Optimum student/teacher ratio of 20 for elementary schools and 18 for secondary.

pre-first-grade students (see chart 2 and chart 4).

It should be mentioned that these estimates of the supply and demand for public elementary and secondary school teachers are subject to shifts between public and private institutions. It is also assumed that since the estimate of the supply of high school teachers is in excess of the foreseeable demand, some of these teachers will turn to elementary schools.

Chart 3—Estimates of the Supply of and Demand for Secondary Teachers—1970
(PUBLIC)

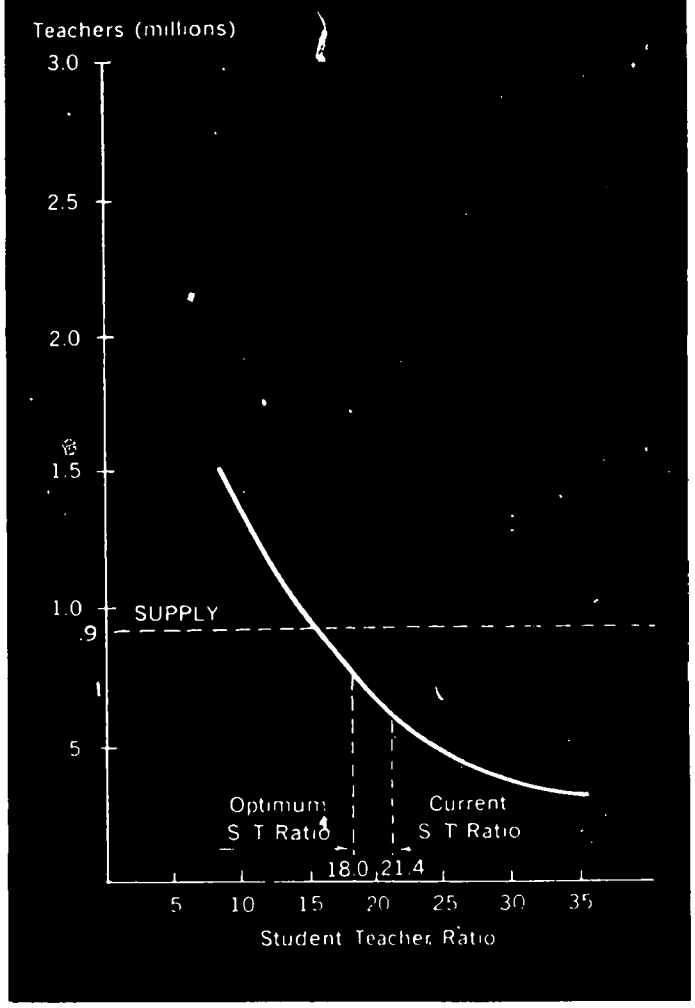
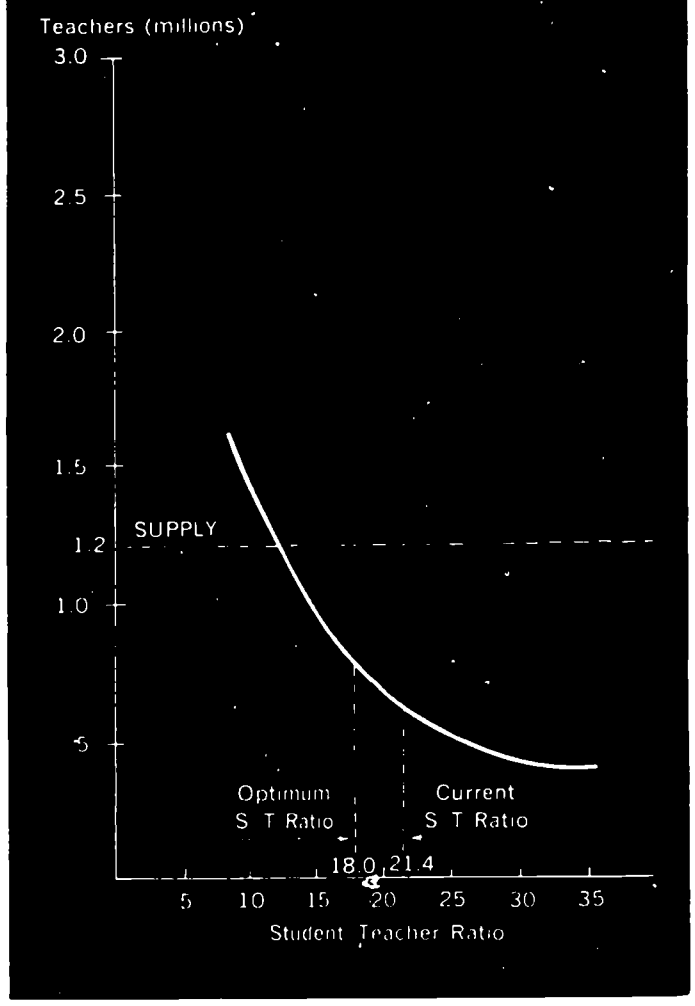


Chart 4—Estimates of the Supply of and Demand for Secondary Teachers—1975
(PUBLIC)



TECHNICAL NOTES

The basic expression used in projecting the number of teachers by age and sex for 1970 and 1975 is:

$$P_{t+1}=(P_t+B_{t+1})*D_{t+1}+(R_{t+1}+T_{t+1})$$

P_t=Number of teachers in period t
P_{t+1}=Number of teachers in period $t+1$
B=Number of beginning teachers
D=Survival rate
R=Number of retirements
T=Net turnover for teachers

This equation is applied to each age and sex group for every projection period. The number of teachers (P) in period t is taken from the 1960 census. The number of beginning teachers (B) is estimated from data on the number of bachelor's and first professional degrees earned each year, those with teaching qualifications, and the proportion of this group entering the classroom the following fall. These data and the assumption used for projecting the number of beginning teachers are shown in table 14—Projections of Beginning Teachers, 1960 to 1975. Projections of the number of beginning teachers are distributed by age and sex according to recent trends and 1960 census information. The expected number of deaths among teachers is accounted for by applying age-sex specific survival rates (D) to the base-year population. The remaining teachers are carried forward to the next time period.

Retirement rates for age-sex specific groups of teachers were derived from a comparison of 1950 and 1960 census data on teachers. Teachers 50 years old or over in 1950 were carried forward by 10-year age groups to 1960. Survival rates were applied in order to account for those who died during the decade. The remaining variations in numbers within these older age groups were assumed to have retired. This appears to be a reasonable assumption since any person who is teaching after his 50th birthday is likely to leave teaching for only one of two reasons—death or retirement.

Turnover rates for teachers were computed along the same line as retirement rates. The number of teachers 20 to 49 years old in 1950 was carried forward to 1960, and a survival rate was applied to determine the expected number of teachers in 1960. The difference between the expected number of teachers in 1960 and the actual number determined the net turnover rate for each age-sex group of teachers. These rates are either positive or negative depending upon the net mobility of individuals into or out of the teaching profession.

As an example of how these projections are calculated, let us consider women teachers between the ages of 35 to 39 in 1960 and estimate the magnitude of

TABLE 14.—*Projections of beginning teachers, 1960 to 1975*

Year	Number of bachelor's and first professional earned degrees [1]	Percent prepared to teach [2]	Potential teachers	Percent entering classroom [2]	Beginning teachers
1960–61	398, 712	33. 2	132, 372	74. 3	98, 352
1961–62	417, 846	33. 5	139, 978	74. 4	104, 144
1962–63	447, 622	34. 1	152, 639	73. 8	112, 648
1963–64	498, 654	34. 5	172, 036	72. 7	125, 070
1964–65	535, 031	34. 9	186, 726	72. 0	134, 443
1965–66	552, 515	35. 0	193, 380	73. 0	141, 167
1966–67	570, 000	35. 0	199, 500	73. 0	145, 635
1967–68	673, 000	34. 5	232, 185	73. 0	169, 495
1968–69	739, 000	35. 0	258, 650	73. 0	188, 815
1969–70	736, 000	35. 0	257, 600	73. 0	188, 048
1970–71	750, 000	35. 0	262, 500	73. 0	191, 625
1971–72	779, 000	35. 0	272, 650	73. 0	199, 035
1972–73	816, 000	35. 0	285, 600	73. 0	208, 488
1973–74	856, 000	35. 0	299, 600	73. 0	218, 708
1974–75	894, 000	35. 0	312, 900	73. 0	228, 417

[1] U.S. Office of Education, *Projections of Educational Statistics to 1975–76.* Washington, D.C., 1966.

[2] National Education Association, *Teacher Supply and Demand in Public Schools, 1966,* Washington, D.C., 1966.

this group in 1970. At this date these women teachers will be in the age group 45 to 49.

Using the general expression for projecting teachers we have the following:

$$P_{t+1}=(P_t+B_{t+1}) * D_{t+1}+(R_{t+1}+T_{t+1})$$

where,

P_t=Number of women teachers age 35–39 in the base year 1960.

P_{t+1}=Number of women teachers age 45–49 in the projected year 1970.

B_{t+1}=Number of beginning women teachers who will be 45–49 in 1970.

D_{t+1}=Survival rate of women teachers who will be 45–49 in 1970.

R_{t+1}=Number of retirements among women teachers who will be 45–49 in 1970.

T_{t+1}=Net turnover of women teachers who will be 45–49 in 1970.

In this example the actual numerical calculations are as follows:

$$P_{t+1}=(P_t+B_{t+1}) * D_{t+1}+(R_{t+1}+T_{t+1})$$
$$=(98{,}633+0) * .947175+(0+42{,}315)$$
$$P_{t+1}=135{,}738$$

The number of women teachers ages 35 to 39 (P_t) in 1960 was 98,633. It is assumed that there will be no measurable number of beginning women teachers (B) in this age group between 1960 and 1970. The survival rate (D) for women between these ages over the decade is 0.947175. Since few women in this age group retire, this figure (R) is assumed to be zero. The turnover rate (T) for women teachers of this age group is highly positive with an estimated 42,315 additional women being available in 1970. The main reason for this large influx of women teachers in their late thirties is that women normally return to the labor force after raising a family.

Estimates of the number of teachers in other age-sex groups are derived in a similar manner. These estimates can be made for either 5- or 10-year periods.

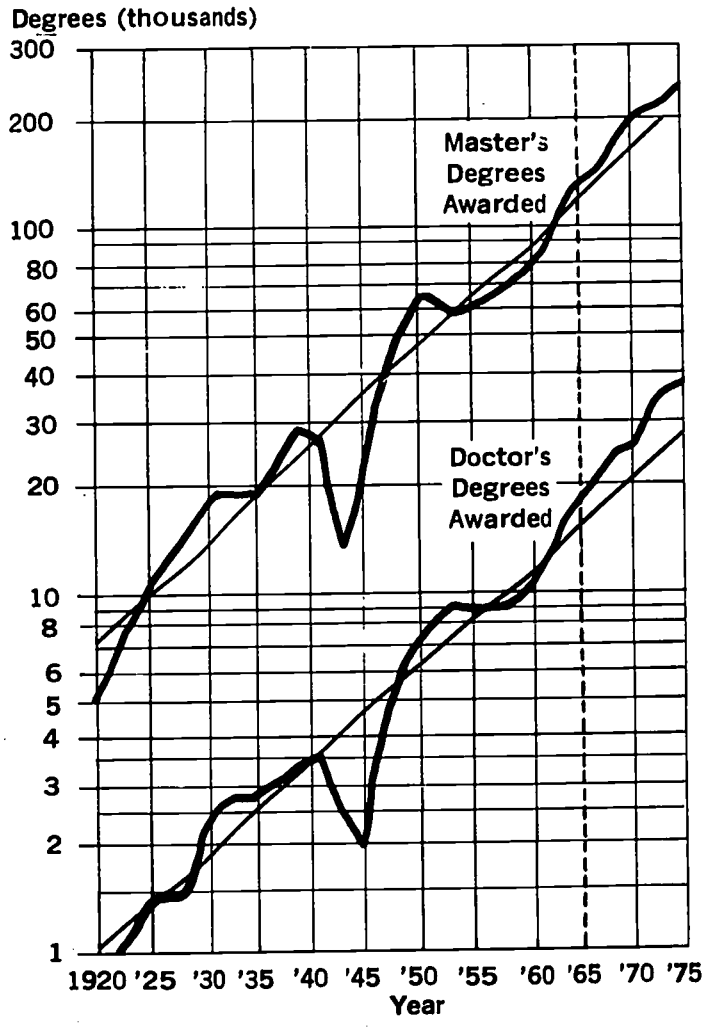
4. The Demand and Supply of Instructional Staff In Higher Education*

The demand for instructional staff at institutions of higher education can be viewed as a function of (1) the expected number of full-time equivalent students and (2) the desired student-staff ratio. At given salary levels offered to instructional staff, the supply of staff members may be viewed as a function of (1) the number of individuals in the population with the desired qualifications for teaching and (2) the opportunity for those individuals to obtain employment in competing fields.

The brief evaluation of these factors developed in tables 15–A, 15–B, 15–C, 16, and 17, and chart 5 suggests that the market for persons with a master's degree or higher may continue to be tight during the next 2 or 3 years, but that this pressure should be moderated considerably beginning with academic year 1969–70 or 1970–71. Whether the market remains tight during the 2 or 3 years depends largely on the level of expenditures for research and development and basic research. National Science Foundation projections for these expenditures during 1968 imply that the amount expended per person in the population with an advanced degree may fall from prior-year levels. If the National Science Foundation projections prove correct, the current market for research professionals and faculty may be essentially stable during the next 2 years. However, as shown in table 16, if research expenditures continue to rise as a proportion of the total Gross National Product—as they have over the past decade—then the market for people with advanced degrees will continue tight during the next 2 or 3 years.

Nevertheless, because the number of persons 65 years of age and under who hold an advanced degree is increasing at a faster rate than the number of students in higher education, one may expect no severe shortage of faculty during the next 7 years, providing economic events do not exceed the conditions described below.

Chart 5—Masters and Doctorate Degrees Awarded: 1920–1975



NOTE: Least squares trend was fitted to the logs of the number of degrees award from 1920 to 1965. The slopes of the two trend lines are identical.

Although it may be necessary for the student/faculty ratio to continue to increase slightly during the next 2 or 3 years, there is some evidence that by 1973 this ratio could be returned to its present level without a corresponding increase in the proportion of advanced degree holders engaged in teaching. Because the num-

Prepared by James C. Byrnes, Office of Program Planning and Evaluation, U.S. Office of Education.

TABLE 15–A.—*Estimated total population holding a master's or higher degree, full-time equivalent (FTE) instructional staff at institutions of higher education, and full-time equivalent degree credit students: 1959 to 1973 (assuming student/staff ratio continues present trend)*

Year (fall)	Population with master's or higher	FTE instructional staff	FTE students	FTE students per staff (3)÷(2)	Instructional staff as a percent of degree population (2)÷(1)
	(1)	(2)	(3)	(4)	(5)
	(*Thousands*)	(*Thousands*)	(*Thousands*)	(*Number*)	
1959	1,117	201	2,665	13.3	18
1960	1,183	210	2,835	13.5	18
1961	1,252	223	3,092	13.9	18
1962	1,330	239	3,322	13.9	18
1963	1,410	254	3,539	13.9	18
1964	1,498	276	3,924	14.2	18
1965	1,597	306	4,443	14.5	19
1966	1,708	330	4,856	14.7	19
	A. MAINTENANCE-OF-EFFORT PROJECTION				
1967	1,825	365	5,401	14.8	20
1968	1,942	382	5,771	15.1	20
1969	2,069	388	5,972	15.4	19
1970	2,223	400	6,240	15.6	18
1971	2,393	412	6,507	15.8	17
1972	2,563	419	6,750	16.1	16
1973	2,733	429	6,993	16.3	16
	B. MEDIUM PROJECTION				
1967	1,825	378	5,587	14.8	21
1968	1,942	397	5,988	15.1	20
1969	2,069	410	6,321	15.4	20
1970	2,223	426	6,644	15.6	19
1971	2,393	440	6,959	15.8	18
1972	2,563	450	7,237	16.1	18
1973	2,733	460	7,495	16.3	17

ber of persons 65 and under who hold the master's degree and the number who hold the doctor's degree are both increasing at a faster rate than the number of full-time equivalent students (FTE) in higher education, one may expect that the quality of faculty as measured by the proportion of faculty holding the doctor's degree will continue to improve. There is some evidence that this proportion has improved significantly during the past decade. The National Education Association reports that 40 percent of the instructional staff of 4-year colleges and universities held the doctor's degree in 1953.[17] The Office of Education reports that 51 percent of all teaching faculty held the doctor's degree in the spring of 1963.[18]

The information shown in table 17 suggests that in the population 65 years of age or under the proportion of persons who hold a doctor's degree among all those who hold an advanced degree has remained almost constant from 1959 to date. Projections of the number of doctor's degrees awarded annually to 1973, published by the National Center for Educational Statistics, imply that this proportion will rise during the next 6 years. The historical data on number of advanced degrees awarded from 1920 to 1965 show that

[17] National Education Association, *Teacher Supply and Demand in Universities, Colleges, and Junior Colleges* (1963–64 and 1964–65 editions), Washington, D.C., p. 13.

[18] U.S. Office of Education, *Teaching Faculty in Universities and 4-year Colleges, Spring 1963,* Washington, D.C., 1963, p. 5.

TABLE 15–B.—*Estimated total population holding a master's or higher degree, full-time equivalent (FTE) instructional staff at institutions of higher education, and full-time equivalent degree credit students: 1959 to 1973 (assuming student/staff ratio remains at present level)*

Year (fall)	Population with master's or higher (1)	FTE instructional staff (2)	FTE students (3)	FTE students per staff (3)÷(2) (4)	Instructional staff as a percent of degree population (2)÷(1) (5)
	(*Thousands*)	(*Thousands*)	(*Thousands*)	(*Number*)	
1959	1,117	201	2,665	13.3	18
1960	1,183	210	2,835	13.5	18
1961	1,252	223	3,092	13.9	18
1962	1,330	239	3,322	13.9	18
1963	1,410	254	3,539	13.9	18
1964	1,498	276	3,924	14.2	18
1965	1,597	306	4,443	14.5	19
1966	1,708	330	4,856	14.7	19
	A. MAINTENANCE-OF-EFFORT PROJECTION				
1967	1,825	367	5,401	14.7	20
1968	1,942	393	5,771	14.7	20
1969	2,069	406	5,972	14.7	20
1970	2,223	424	6,240	14.7	19
1971	2,393	443	6,507	14.7	19
1972	2,563	459	6,750	14.7	18
1973	2,733	476	6,993	14.7	17
	B. MEDIUM PROJECTION				
1967	1,825	380	5,587	14.7	21
1968	1,942	407	5,988	14.7	21
1969	2,069	430	6,321	14.7	21
1970	2,223	452	6,644	14.7	20
1971	2,393	473	6,959	14.7	20
1972	2,563	492	7,237	14.7	19
1973	2,733	510	7,495	14.7	19

the long-term trend in the ratio of the number of doctor's degrees awarded to the number of master's degrees awarded has remained constant for the past 45 years (see chart 5).

Annual estimates of the number of persons 65 years of age or younger holding a master's or higher degree were derived by multiplying the number of master's degrees awarded and projected from 1919 to 1973 by appropriate survival rates and cumulating the products for an assumed working life of 40 years. The same procedures were used in estimating the number of persons holding the doctor's degree, except that an assumed average working life of 33 years beyond the receipt of the doctor's degree was used. A more detailed description of the method is given in the notes accompanying table 15. The projected number of full-time equivalent degree-credit students in institutions of higher education was derived from the OPPE enrollment model for higher education.

The assumptions regarding general economic conditions to 1973 are as follows:

1. Gross national product is assumed to increase at an annual rate of 7.5 percent (in current dollars), as observed from 1961 to 1966.
2. Total expenditures for research and development and basic research as a proportion of GNP are assumed to increase at the rate of 2 percent per year, as observed from 1961 to 1966.
3. The number of FTE degree-credit students in higher education is assumed not to exceed that implied by the OPPE maintenance-of-effort projection for Federal student-aid programs during the 1967–68 and 1968–69 academic years and not to exceed the medium projection thereafter.

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TABLE 15-C.—*Estimated total population holding a master's or higher degree, full-time equivalent (FTE) instructional staff at institutions of higher education, and full-time equivalent degree credit students: 1959 to 1973 (assuming student/staff ratio is reduced to 1959 level)*

Year (fall)	Population with master's or higher	FTE instructional staff	FTE students	FTE students per staff (3)÷(2)	Instructional staff as a percent of degree population (2)÷(1)
	(1)	(2)	(3)	(4)	(5)
	(*Thousands*)	(*Thousands*)	(*Thousands*)	(*Number*)	
1959	1, 117	201	2, 665	13. 3	18
1960	1, 183	210	2, 835	13. 5	18
1961	1, 252	223	3, 092	13. 9	18
1962	1, 330	239	3, 322	13. 9	18
1963	1, 410	254	3, 539	13. 9	18
1964	1, 498	276	3, 924	14. 2	18
1965	1, 597	306	4, 443	14. 5	19
1966	1, 708	330	4, 856	14. 7	19
		A. MAINTENANCE-OF-EFFORT PROJECTION			
1967	1, 825	400	5, 401	13. 5	22
1968	1, 942	427	5, 771	13. 5	22
1969	2, 069	442	5, 972	13. 5	21
1970	2, 223	462	6, 240	13. 5	21
1971	2, 393	482	6, 507	13. 5	20
1972	2, 563	500	6, 750	13. 5	20
1973	2, 733	518	6, 993	13. 5	19
		B. MEDIUM PROJECTION			
1967	1, 825	414	5, 587	13. 5	23
1968	1, 942	444	5, 988	13. 5	23
1969	2, 069	468	6, 321	13. 5	23
1970	2, 223	492	6, 644	13. 5	22
1971	2, 393	515	6, 959	13. 5	22
1972	2, 563	536	7, 237	13. 5	21
1973	2, 733	555	7, 495	13. 5	20

SOURCES

Column (1): The number of master's degrees awarded by year from 1919 to 1965 and projected to 1973 was multiplied by the appropriate survival rate for white males from 1 to 40 years beginning with age 25 and cumulated to obtain the total population in each year from 1959 to 1973. The number of master's degrees awarded is published by the National Center for Educational Statistics. Missing data for even-numbered years from 1920 to 1946 were obtained by interpolation. Survival rates for 1 to 40 years beginning at age 25 were computed from *United States Life Tables: 1959–61*, U.S. Public Health Service. The use of the 1959-61 life tables for white males is believed to be an appropriate estimate of the mortality experience of the more highly educated population since 1920.

Column (2): For the period 1959 to 1966, the number of full-time equivalent instructional staff in all institutions of higher education was taken from U.S. Office of Education, *Projections of Educational Statistics to 1975-76*. For the alternative projections 1967 to 1973, the number is the result of dividing the number shown in column (3) by that shown in column (4).

Column (3): For the period 1959 to 1966, the number of full-time equivalent degree credit students in all institutions of higher education is published in *Projections*. For the alternative projections 1967 to 1973, data are taken from the OPPE Higher Education Enrollment Model.

TABLE 16.—*Estimated population holding master's or higher degree, gross national product, and total expenditures for research and development and basic research: 1959 to 1973*

Year	Population with master's or higher (1)	R. & D. and basic research (2)	Research expenditures per capita (2) ÷ (1) (3)	GNP (4)	Percentage (2) ÷ (4) (5)
	(*Thousands*)	(*Billion dollars*)	(*Thousand dollars*)	(*Billion dollars*)	
1959	1,117	13.7	12.3	483.6	2.8
1960	1,183	15.0	12.7	503.8	3.0
1961	1,252	16.0	12.8	520.1	3.1
1962	1,330	17.5	13.2	560.3	3.1
1963	1,410	19.6	13.9	590.5	3.3
1964	1,498	21.7	14.5	631.7	3.4
1965	1,597	23.4	14.7	681.2	3.4
1966	1,708	25.5	14.9	739.6	3.4
1967	1,825	27.8	15.2	795.1	3.5
1968	1,942	29.9	15.4	854.7	3.5
1969	2,069	33.1	16.0	918.8	3.6
1970	2,223	36.5	16.4	987.7	3.7
1971	2,393	39.3	16.4	1,061.8	3.7
1972	2,563	43.4	16.9	1,141.4	3.8
1973	2,733	47.8	17.5	1,227.0	3.9

SOURCES

Column (1): Source given in notes to table 15.

Column (2): For the years 1959 to 1966, data are from the National Science Foundation. For the projected years 1967 to 1973, values shown are the result of multiplying the percentage in column (5) times the amount shown in column (4).

Column (3): The amount shown in column (2) divided by the number shown in column (1).

Column (4): For the years 1959 to 1966, data are published by the U.S. Department of Commerce, Office of Business Economics. For the projected years 1967 to 1973, GNP is assumed to increase at the rate of 7.5 percent per year as observed from 1961 to 1966.

Column (5): For the projected years, the ratio of column (2) to column (4) is assumed to increase at the rate of 2 percent per year as observed from 1961 to 1966.

TABLE 17.—*Estimated population age 65 or under holding a master's or higher degree and percentage holding doctor's degree: 1959 to 1973*

Year (fall)	Total	Master's	Doctor's	Percent of total holding doctor's [1] (3)÷(1)
	(1)	(2)	(3)	(4)
	(*Thousands*)	(*Thousands*)	(*Thousands*)	
1959	1, 117	979	138	12. 4
1960	1, 183	1, 036	147	12. 4
1961	1, 252	1, 097	155	12. 4
1962	1, 330	1, 166	164	12. 3
1963	1, 410	1, 236	174	12. 3
1964	1, 498	1, 312	186	12. 4
1965	1, 597	1, 398	199	12. 5
1966	1, 708	1, 494	214	12. 5
1967	1, 825	1, 596	229	12. 5
1968	1, 942	1, 695	247	12. 7
1969	2, 069	1, 802	267	12. 9
1970	2, 223	1, 935	288	13. 0
1971	2, 393	2, 084	309	12. 9
1972	2, 563	2, 231	332	13. 0
1973	2, 733	2, 374	359	13. 1

Sources: The same procedures and data sources described in the notes for table 15 were used for the estimates of the number of doctor's degrees awarded shown in column (3), except that an assumed average working life of 33 years beyond receipt of the doctor's degree was used with appropriate survival rates.

[1] Following 1967, these results, which are largely dependent upon a particular projection of degrees awarded, imply a rising trend in the proportion of persons with an advanced degree who hold the doctor's degree. It is doubtful that this will occur, because the long-term trend in the ratio of doctor's degrees awarded to master's degrees awarded has remained constant from 1920 to date and there is no clear evidence that this relationship will change in the future. (See chart 5.)

5. An Analysis of Expenditures in Education *

The following analysis of expenditures in education is presented at three levels. It summarizes the outlays of public elementary and secondary school systems, presents data on trends in outlays of State education agencies, and reports on trends in expenditures for higher education.

Each of these three kinds of expenditures has experienced considerable growth over the 10-year period covered by the analysis. In the case of public elementary and secondary education (which accounts for almost 90 percent of all outlays for elementary and secondary education), total outlays increased by 132.2 percent over the past 10 years. Expenditures for administration by State boards and departments of education increased 197 percent in this period, and those for higher education increased 258 percent.

SOURCE OF FUNDS

The increase in expenditures radically altered the shares of the different levels of government in financing education. For instance, in elementary and secondary education local governments provided, in the 1955–56 school year, 63 percent of total funds; by 1966, their share of total outlays had declined to 55 percent. In contrast, the States increased their share of financing elementary and secondary outlays from 33 percent to more than 37 percent and the Federal Government increased its share from 4 to almost 8 percent (see table 18).

In higher education, 54 percent of expenditures came from private sources in 1956 as compared to 49 percent in 1966. Local government sources maintained a relatively constant share, about 3 percent of total expenditures in 1956 and 2.8 percent in 1966. State governments also maintained a fairly constant share, 28 percent of total funds in 1956 and 25 percent in 1966. By contrast, the Federal Government increased its share of total funds from 15.6 percent in 1956 to 23.6 percent in 1966 (see table 20).

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ELEMENTARY AND SECONDARY EDUCATION

Expenditure patterns for elementary and secondary education did not change radically in the 10-year period (see tables 18 and 21). Instructional salaries take about 60 percent of current expenditures. The category showing a significant increase as a percentage of current expenditures was "other current expenditures," 0.8 percent in 1956 and 1.8 percent in 1966, due principally to recent growth in summer school and adult education programs. In dollar terms, instructional salaries increased 148 percent; other instructional costs, 207 percent; other pupil costs, 164 percent; operation and maintenance of plant, 132 percent; and administration, 179 percent. Plant fund outlays increased 46 percent and interest payments 281 percent.

The roles of the different levels of government in funding these expenditure categories have changed considerably in the period under review. In public elementary and secondary education expenditures, for example, the Federal Government in 1956 contributed only $486 million. More than half this total was for school lunches and education of military dependents and Indians. Otherwise, the only significant contributions to local school programs were funds for federally impacted areas and vocational education. By 1966, Federal involvement had become more significant in the various expenditure categories. Most notable among these were outlays for instructional salaries of $846 million, slightly more than 6 percent of the total; subsidies to other pupil costs such as food, health, and transportation services, 13 percent of the total; and funds for other current expenditures, such as outlays for summer schools, adult education, and community services, 23.8 percent of the total. The school lunch program and preschool programs under the Economic Opportunity Act and the Elementary and Secondary Education Act account for the higher Federal contributions in these last categories.

State funds increased at higher rates in other instructional costs and other current expenditure categories during this period. The States' share increased in all expenditure categories with the exception of administration, interest payments and other instruc-

TABLE 18.—*Expenditures for public elementary and secondary schools, by source of funds, 1956–66* [1]

[In thousands of dollars]

Year and source of funds	Total expenditures [2]	Current funds							Capital outlay	Interest
		Total current	Instructional salaries	Other instructional costs	Other pupil costs	Operation and maintenance of plant	Administration	Other current expenditures		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1955–56 total	$11,158,972	$8,342,972	$5,154,418	$403,403	$1,317,244	$1,081,699	$316,035	$70,173	$2,600,000	$216,000
Federal	485,762	370,748	112,219	10,707	204,493	26,576	8,672	8,081	114,566	448
State	3,691,390	3,270,476	1,998,023	156,964	510,133	418,571	147,153	39,632	408,914	12,000
Local	6,981,820	4,701,748	3,044,176	235,732	602,618	636,552	160,210	22,460	2,076,520	203,552
1957–58 total	13,843,069	10,400,069	6,451,300	537,332	1,618,151	1,321,270	388,958	83,058	3,100,000	343,000
Federal	578,853	474,162	144,572	13,389	265,889	31,341	10,178	8,793	103,919	782
State	4,809,896	4,301,600	2,643,827	219,601	667,415	538,238	185,154	47,365	493,506	14,790
Local	8,454,310	5,624,307	3,662,901	304,342	684,847	751,691	193,626	26,900	2,502,575	327,428
1959–60 total	15,578,161	12,288,161	7,751,300	684,087	1,955,620	1,341,309	456,871	98,974	2,800,000	490,000
Federal	762,588	660,362	192,202	58,432	344,710	40,109	11,892	13,017	101,376	850
State	5,699,969	5,261,113	3,240,846	284,100	820,734	636,594	220,967	57,872	423,856	15,000
Local	9,115,604	6,366,686	4,318,252	341,555	790,176	664,606	224,012	28,085	2,274,768	474,150

1961–62 total.....	18, 313, 933	14, 725, 933	9, 302, 600	834, 127	2, 330, 187	1, 573, 424	560, 954	124, 641	3, 000, 000	588, 000
Federal.....	924, 356	825, 607	251, 475	65, 569	425, 512	51, 378	16, 273	15, 400	97, 673	1, 076
State.....	6, 806, 367	6, 377, 456	3, 924, 590	344, 038	993, 889	751, 788	280, 327	82, 824	413, 911	15, 000
Local.....	10, 583, 210	7, 522, 870	5, 126, 535	424, 520	910, 786	770, 258	264, 354	26, 417	2, 488, 416	571, 924
1963–64 total.....	21, 251, 152	17, 461, 152	10, 878, 050	984, 218	2, 764, 176	2, 003, 831	646, 982	183, 895	3, 100, 000	690, 000
Federal.....	1, 052, 243	957, 360	289, 464	110, 696	438, 172	67, 102	20, 094	31, 832	93, 683	1, 200
State.....	8, 003, 426	7, 499, 426	4, 620, 140	416, 570	1, 173, 970	855, 862	318, 108	114, 776	486, 000	18, 000
Local.....	12, 195, 483	9, 004, 366	5, 968, 446	456, 952	1, 152, 034	1, 080, 867	308, 780	37, 287	2, 520, 317	670, 800
1964–65 total.....	23, 319, 400	19, 077, 400	11, 702, 600	1, 070, 968	3, 000, 920	2, 169, 896	761, 772	371, 244	3, 500, 000	742, 000
Federal.....	1, 146, 134	1, 048, 880	352, 000	115, 030	399, 070	72, 992	26, 875	82, 913	96, 054	1, 200
State.....	8, 746, 944	8, 230, 444	5, 048, 998	454, 492	1, 280, 842	908, 985	330, 540	206, 587	498, 000	18, 500
Local.....	13, 426, 322	9, 798, 076	6, 301, 602	501, 446	1, 321, 008	1, 187, 919	404, 357	81, 744	2, 905, 946	722, 300
1965–66 total.....	25, 915, 072	21, 292, 072	12, 802, 600	1, 238, 730	3, 475, 030	2, 512, 714	882, 123	380, 875	3, 800, 000	823, 000
Federal.....	2, 000, 229	1, 833, 944	845, 683	325, 458	451, 507	82, 268	38, 528	90, 500	164, 785	1, 500
State.....	9, 727, 725	9, 182, 725	5, 645, 550	509, 025	1, 434, 525	1, 018, 050	370, 200	205, 375	525, 000	20, 000
Local.....	14, 187, 118	10, 275, 403	6, 311, 367	404, 247	1, 588, 998	1, 412, 396	473, 395	85, 000	3, 110, 215	801, 500

[1] For definition of terms and discussion of estimates and sources of data, see text.
[2] Excludes expenditures for State administration and for community colleges; includes expenditures for special schools.

Source: Based primarily on data in the *Digest of Educational Statistics* series and financial survey reports of the Office of Education. Federal data from agency fiscal reports and Special Analysis G, *U.S. Budget*, 1967.

tional costs. In the last category, grants under the Elementary and Secondary Education Act provided an increased Federal share.

Local governments financed the remainder of public school outlays. On the whole, as noted above, they financed a somewhat smaller share of total elementary and secondary school expenditures, especially in the administration, other instructional costs and other current expenditure categories. In this last category, the States did more than their share in taking up the slack.

STATE ADMINISTRATION

In expenditures for State administration, which increased almost 200 percent from 1956 to 1966, the Federal share increased sharply from 5 percent to 37 percent of the total. The National Defense Education Act increased the Federal share to almost 12 percent, and the Elementary and Secondary Education Act provided the larger increase at the current level (see tables 19 and 22).

TABLE 19.—*Expenditures for administration for State boards of education and State departments of education, by source of funds, 1956–1966*

[In thousands of dollars]

Year and source	State board of education				State departments of education				Total State administration
	Expenses of board members	Salaries of staff	Supplies, travel, other	Total	Administration and professional salaries	Other staff salaries	Supplies, travel, other	Total	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1956 total	130	1,573	482	2,185	26,438	11,166	17,132	54,736	56,921
Federal					1,384	584	897	2,865	2,865
State	130	1,573	482	2,185	25,054	10,582	16,235	51,871	54,056
1958 total	164	1,622	591	2,377	26,702	11,263	17,326	55,291	57,667
Federal					1,672	706	1,083	3,461	3,461
State	164	1,622	591	2,377	25,030	10,557	16,243	51,830	54,206
1960 total	185	1,891	837	2,912	32,777	14,459	24,688	71,925	74,837
Federal					4,023	1,775	3,031	8,829	8,829
State	185	1,891	837	2,912	28,754	12,684	21,657	63,096	66,008
1962 total	211	1,851	716	2,778	39,372	18,062	33,806	91,240	94,018
Federal					4,453	2,042	3,822	10,317	10,317
State	211	1,851	716	2,778	34,919	16,020	29,984	80,923	83,701
1964 total	269	2,540	747	3,555	43,560	19,965	37,309	100,834	104,388
Federal					5,087	2,331	4,356	11,774	11,774
State	269	2,540	747	3,555	38,473	17,634	32,952	89,059	92,614
1965 total	299	2,813	827	3,939	48,353	22,162	41,413	111,928	115,867
Federal					7,395	3,390	6,334	17,119	17,119
State	299	2,813	827	3,939	40,958	18,772	35,079	94,809	98,748
1966 total	514	4,828	1,420	6,762	70,111	32,134	60,049	162,294	169,056
Federal					27,349	12,535	23,424	63,308	63,308
State	514	4,828	1,420	6,762	42,762	19,599	36,625	98,986	105,748

TABLE 20.—*Expenditures of institutions of higher education, by purpose and by source of funds: 1956 through 1966*

[Amounts in millions]

Year, by source	Current funds							Plant funds	Total expenditures
	Student education	Organized research	Extension and public service	Related activities	Auxiliary service	Student aid	Total current		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1956 total	1,788.6	545.0	141.2	208.7	599.6	95.6	3,378.7	811.3	4,190.0
Federal	86.0	356.6	46.5	1.0	4.2	11.6	505.9	149.2	655.1
State	676.5	70.3	38.2	82.0	.....	33.7	900.7	257.6	1,158.3
Local	85.7	8.4	4.5	9.9	.....	4.0	112.5	17.3	129.8
Other	940.4	109.7	52.0	115.8	595.4	46.3	1,859.6	387.2	2,246.8
1958 total	2,291.7	796.1	179.0	228.3	725.2	130.1	4,350.4	1,051.5	5,401.9
Federal	105.6	534.2	51.1	1.9	8.2	14.0	715.0	221.6	936.6
State	875.3	104.1	51.0	90.1	.....	47.1	1,167.6	376.4	1,544.0
Local	96.7	11.6	5.7	10.1	.....	5.2	129.3	45.5	174.8
Other	1,214.1	146.2	71.2	126.2	717.0	63.8	2,338.5	408.0	2,746.5
1960 total	2,754.4	1,121.0	208.1	281.1	852.4	172.1	5,389.1	1,217.5	6,606.6
Federal	150.5	828.7	52.1	3.0	11.3	17.5	1,063.1	195.5	1,258.6
State	1,040.3	118.5	62.5	111.4	.....	62.0	1,394.7	370.0	1,764.7
Local	112.9	12.9	6.8	11.9	.....	6.4	150.9	36.3	187.2
Other	1,450.7	160.9	86.7	154.8	841.1	86.2	2,780.4	615.7	3,396.1
1962 total	3,356.9	1,623.3	246.2	345.6	1,073.5	228.8	6,874.3	1,691.7	8,566.0
Federal	265.4	1,252.9	59.1	4.8	13.9	18.5	1,614.6	249.4	1,864.0
State	1,258.0	151.1	75.6	138.0	.....	85.0	1,707.7	513.9	2,221.6
Local	140.3	16.9	8.7	15.6	.....	9.5	191.0	35.5	226.5
Other	1,693.2	202.4	102.8	187.2	1,059.6	115.8	3,361.0	892.9	4,253.9
1964 total	4,260.0	2,174.2	298.6	433.5	1,341.4	300.4	8,808.1	2,405.6	11,213.7
Federal	384.3	1,675.2	82.4	7.6	16.9	25.8	2,192.2	370.9	2,563.1
State	1,567.0	205.8	92.0	171.8	.....	110.7	2,147.3	695.0	2,842.3
Local	168.5	21.1	9.1	18.3	.....	11.5	228.5	40.0	268.5
Other	2,140.2	272.1	115.1	235.8	1,324.5	152.4	4,240.1	1,299.7	5,539.8
1965 total	5,101.7	2,324.8	370.5	498.5	1,542.6	360.0	10,198.1	2,701.5	12,899.6
Federal	494.8	1,770.7	82.6	8.9	20.6	47.3	2,424.9	606.5	3,031.4
State	1,841.7	215.8	116.1	196.9	.....	126.0	2,496.5	735.1	3,231.6
Local	214.3	25.1	13.4	23.4	.....	14.8	291.0	56.0	347.0
Other	2,550.9	313.2	158.4	269.3	1,522.0	171.9	4,985.7	1,303.9	6,289.6
1966 total	6,120.6	2,517.7	437.3	601.3	1,880.0	435.6	11,992.5	3,025.9	15,018.4
Federal	612.1	1,940.7	100.5	12.0	20.2	98.5	2,784.0	754.6	3,538.6
State	2,197.3	219.1	141.5	236.3	.....	142.4	2,936.6	795.0	3,731.6
Local	257.0	29.7	16.8	29.5	.....	17.3	350.3	64.0	414.3
Other	3,054.2	328.2	178.5	323.5	1,859.8	177.4	5,921.6	1,412.3	7,333.9

TABLE 21.—*Expenditures for other instructional costs in public elementary and secondary schools, 1956–66* [1]

[In thousands of dollars]

Year	Total	Salaries of secretarial and clerical assistants to instructional personnel	Free textbooks	School library books	Supplies and other expenditures
	(1)	(2)	(3)	(4)	(5)
1956	$398,803	$85,980	$75,626	$20,417	$216,780
1958	532,722	127,271	101,890	31,525	272,037
1960	679,487	174,513	131,212	44,568	329,195
1962	824,927	233,326	142,350	64,265	384,986
1964	975,018	277,880	175,503	92,627	429,008
1965 [2]	1,061,768	302,604	191,118	100,868	467,178
1966 [2]	1,229,530	350,416	221,315	116,805	540,994

[1] Includes regular schools only. [2] Estimates based on 1964 distribution.

HIGHER EDUCATION

For higher education, the highest rates of increase occurred in expenditures for organized research and student aid. Research expenditures grew 362 percent and student aid outlays 356 percent from 1956 to 1966. Student education expenditures increased 242 percent. Student education includes current costs assigned to instructional programs, and excludes expenditures for organized research, extension and auxiliary enterprise services. Expenditures per full-time equivalent student for student education were $810 in 1956 and $1,312 in 1966.

The Federal share of total current expenditures increased from about 15 percent in 1956 to 23 percent in 1966, in total funds an increase of 450 percent. Included here are research funds, for which the Federal share grew from 65 percent to 77 percent, and student education, with the Federal share growing from 4.8 percent to 10 percent.

State funds for higher education increased 222 percent, with plant fund expenditure increases of 209 percent and current fund increases of 226 percent. The State share of current fund expenditures was 27 percent in 1956 and 24.5 percent in 1966. State funds for plant expansion were 32 percent of the total in 1956 and 26 percent in 1966.

Local funds remained relatively stable—about 3 percent of total expenditures for higher education in 1956 and 2.8 percent in 1966. Funds from other sources—private gifts and grants, student charges, income from auxiliary enterprises, and earnings on investments—provided 54 percent of the total expenditures in 1956 and 48.8 percent in 1966.

INCREASED COSTS

Part of the increase in costs for education can be ascribed to increasing enrollments. On a very crude basis of per capita student costs for elementary and secondary education, we can assign cost increases to rising enrollments and to higher costs per student. In 1966 dollars, annual current expenditures per pupil increased from $349 in 1956 to $532 in 1966. Enrollment increases account, on this basis, for 47 percent of the increased cost of public elementary and secondary education, and increased costs per student for 53 percent.

In higher education, increases in enrollment accounted for 58 percent of the higher costs for student education, and higher costs per student accounted for 43 percent of the increase.

DATA ON EXPENDITURES BY PURPOSE AND SOURCE

This discussion is based primarily on data from educational finance surveys made by the National Center for Educational Statistics. Data on income by source are available from these surveys (through 1964 for higher education, more currently for elementary-secondary education). Data on expenditures by source of funds are more limited and were estimated, as shown in tables 18, 19, and 20, by analysis of income data, Federal program data, and previous estimates of the National Center for Educational Statistics.[19] In esti-

[19] See *Projections of Educational Statistics to 1975–76*, U.S. Office of Education, National Center for Educational Statistics, 1966.

mating source of funds in specific expenditure categories, we first distributed earmarked funds and those that could be allocated by program reports and then distributed the remaining funds on the basis of expenditure patterns of educational institutions. Federal funds were adjusted, where possible, to actual expenditures to more nearly reflect actual payments to school systems.

Much of the Federal input could be allocated to expenditure accounts on the basis of program purpose and program reports on uses of funds provided. For example, preliminary reports on uses of funds under the Elementary and Secondary Education Act provided the basis for allocation to the different expenditure accounts. A large proportion of Federal funds for elementary and secondary education could be allocated to specific categories on this basis. The remaining funds were distributed in the pattern of total school expenditures. State fund distributions were allocated into the various expenditure patterns on the basis of an earlier analysis of State school funds.[20] Local funds were distributed on the basis of total expenditure patterns.

In higher education, the large sums for construction and research could be allocated specifically by source of funds. For student support programs, funds were distributed to student education accounts on the basis of institutional expenditure patterns. State funds distributions were based on income and expenditure data reported by institutions of higher education. The income and expenditure accounts for a given period of time do not provide an exact indicator of expenditures by source of funds, but the estimates of expenditures by source of funds (table 20) are believed to be reasonably accurate.

TECHNICAL NOTES

Definitions

Expenditure categories used in this analysis are defined as follows:

Elementary and Secondary Education Expenditures

Current Expenditures

Administration: Cost of local administrative units.

Instructional salaries: Salaries of entire instructional staff (supervisors, principals, teachers, librarians, guidance personnel, etc.).

Other instructional costs: Cost of textbooks, teaching supplies, school library books, and other instructional supplies and expenses.

Plant operation and maintenance: Salaries of maintenance personnel and cost of fuel, water, and power supplies; upkeep of grounds, buildings, and equipment through repairs or replacement.

Other pupil costs: Fixed charges (payments to teacher retirement funds, social security, insurance premiums, and rent), pupil transportation, and food, health, attendance, and miscellaneous school services.

Other current expenditures: Summer schools, adult education, and community services.

Capital Outlay

Funds expended for acquisition or additions to fixed assets (land, construction and remodeling of buildings, improvement of grounds, initial or additional equipment).

Interest

Interest payments on bonded or nonbonded school debt.

Higher Education Expenditures

Current Expenditures

Student education: Funds for administration and general expense, instruction and departmental research, plant operation and maintenance, and library services. Excludes overhead for organized research (estimated at 15 percent of organized research funds) and extension services (estimated at 5 percent of extension service expenditures).

Organized research: Funds for research and development activities at educational institutions and at university-managed research centers. Includes university overhead for sponsored research.

Extension and public services: Funds for nondegree-credit courses, cooperative extension services, and programs for the general public.

Related activities: Includes funds for activities organized and operated in connection with educational departments and conducted primarily for student training purposes, such as medical-school hospitals, laboratory schools, and testing laboratories.

[20] *State Programs for Public School Support,* unpublished memorandum by Howard Vincent, Office of Program Planning and Evaluation, U.S. Office of Education, 1966.

TABLE 22.—*Summary of Federal funds for State educational agency support, fiscal years 1960 through 1967*

Programs	1960 actual	1961 actual	1962 actual	1963 actual	1964 actual	1965 actual	1966 estimate	1967 estimate
Programs which specify amounts for supervision and administration:								
Elementary and secondary educational activities:								
Assistance for educationally deprived children:								
Grants for State administration expenses							$9,495,049	$11,239,000
Strengthening State departments of education:								
Grants to States							14,450,000	18,700,000
Grants for special projects [1]							[1] 2,550,000	[1] 3,300,000
Higher education facilities construction grants for State administrative expenses						$1,768,631	2,000,000	2,000,000
Defense educational activities:								
Instructional assistance:								
Grants to States for supervision and administration	$2,530,389	$2,413,550	$2,840,850	$2,884,675	$3,365,570	4,530,623	7,500,000	7,500.000
Grants to States for statistical services	1,128,710	1,299,806	1,482,452	1,684,184	1,806,723	1,995,947	2,250,000	2,250,000
Subtotal	3,659,099	3,713,356	4,323,302	4,568,859	5,172,293	8,295,201	38,245,049	44,989,000

Programs under which States may use portions of basic allotments for supervision and administration, but for which funds are not earmarked:								
Expansion and improvement of vocational education:								
Grants to States under Vocational Educational Act of 1963: State supervision and administration						1,211,932	9,958,650	10,954,515
Grants to States under George-Barden and supplemental acts: State supervision and administration	5,169,751	5,248,851	5,993,240	6,113,271	6,601,386	7,109,743	7,657,194	8,246,799
Work-study programs: State administration						301,124	576,802	528,404
Elementary and secondary educational activities: Grants to States for school library materials, State administration							5,000,000	3,150,000
Higher educational activities: Grants to States for community services and continuing education programs, State administration							1,379,446	1,572,415
Grants for public libraries: Grants for library services, State administration	707,865	742,774	819,639	725,660	744,229	2,494,059	2,499,975	2,749,975
Educational improvement for the handicapped: Training grants, State administration						200,951	491,279	[1] 1,475,000
Subtotal	5,877,616	5,991,625	6,812,879	6,838,931	7,345,615	11,317,809	27,563,346	28,677,108
Total	9,536,715	9,704,981	11,136,181	11,407,790	12,517,908	19,613,010	65,808,395	73,666,108

[1] Funds are not alloted to States under formula; therefore, State estimates are not available.

Source: U.S. Congress, House Committee on Appropriations, *Departments of Labor and Health, Education, and Welfare Appropriations for 1967*, Hearings, Part 2. GPO: 1966. p. 135.

Auxiliary services: Includes dining halls, student residence halls, student unions, intercollegiate athletics, faculty housing, and university presses.

Student aid: Student assistance through scholarships, fellowships, and prizes. Excludes loans and compensation for services (as in a teaching fellowship, costs for which would be reported as instructional expense under student education).

Plant funds: Expenditures for purchase of land, construction or acquisition of buildings and additions to buildings, acquisition of equipment, major renewals and improvements to plant, and repayment of debt. Excludes increase in plant value due to revaluation or gifts in kind. Amounts reported thus indicate actual expenditure of funds and not total increase in value of plant. (Value added from revaluation of plant was as following [in millions]: 1958, $55; 1960, $98.1; 1962, $74.9; 1964, $187.3.)

Federal Funds for Education

Fiscal data on Federal funds for education appear in table 23. It will be noted that $9.2 billion was obligated by the Federal Government in 1966 for education and related activities. The part of this total that would be received and spent by school systems and educational institutions appears in tables 18 and 22 showing expenditures by source of funds.

Expenditure of Federal Funds

Elementary and Secondary Schools:

To a large extent, Federal program funds can be allocated to specific expenditure accounts on the basis of their general or special purpose design on the basis of program reports as indicators of use of funds in the schools.

Federal funds which are allocated on the basis of the general pattern of school expenditures include those for:

Federally impacted areas—payments to school districts;

Assistance in special areas (District of Columbia);

Schools for military dependents.

Federal funds which are allocated on the basis of more specific guidelines for determination of expenditure categories include:

Grants to federally impacted areas—grants for construction;

Grants under the Elementary and Secondary Education Act (ESEA);

Guidance and counseling program grants;

Grants for State administration, including ESEA, NDEA, and vocational education funds.

Title I ESEA funds for 1966, for example, are allocated on the basis of preliminary reports from the field on local school expenditure patterns as follows:

[In millions]

For		*Allocated to*	
Salaries	$523	Instructional salaries	$363
		Other current expenditures (summer school salaries).	160
Construction	48	Capital outlay	48
Supplies and instructional equipment.	151	Other instructional expenditures.	151
Pupil services; operation and maintenance of plant.	19	Other pupil costs; plant operation and maintenance.	19

Title II ESEA funds for 1966 are allocated to other instructional costs ($48 million); Title III funds to other instructional costs ($6.6 million) and other pupil costs ($4.1 million). ESEA as a source of expenditures will show a sharp increase in 1967 and after, as the funds complete the flow from Federal to State and local school systems' receipts and then to expenditures accounts. Funds for State administrative services were allocated on the basis of the data presented in table 22.

Higher Education

Table 23 provides data on Federal funds for programs in institutions of higher education. Funds for construction and equipment are identified in this table. Fellowship funds were estimated to provide an average of $2,500 per award as payment to educational institutions. Training grant data of various agencies were reviewed for use of funds patterns. Special Analysis G, *U.S. Budget*, was also a source of estimates on institutional support. Student loans, support of veterans' education, and other programs in the "other student support" category in table 23 are primarily payments to individuals and do not, therefore, affect institutional accounts. Funds for research and development, including payments to universities for management of research centers, provide the largest block of funds to institutional accounts.

Funds paid to universities that were not earmarked for special purposes, such as institutional grants and

cost-of-education payments for fellows, were distributed according to institutional expenditure patterns since the institutions are free to use the funds as they see fit.

State and Local Funds

Data on funds from State and local sources and for higher education from private sources are derived from fiscal survey data of the Office of Education and, for current years, *Projections of Educational Statistics to 1975–76,* modified by recent analysis of State funds for higher education.[21] Some differences should be noted, however. We have excluded community college and State administration expenditures from the elementary and secondary school expenditure data. Community college data are included in the higher education section, and funds for State administration are reported separately.

Estimates of local and other sources of funds, although consistent with expenditure patterns as they can be identified, are subject to some error in the distribution process. Income accounts in fiscal reports identify only partly the source of funds, and income from a particular source may not be spent in the same fiscal reporting period. Some residual error therefore occurs in estimating these relationships.

More systematic analysis of these data and of expenditure patterns of educational institutions is needed, but the general patterns of expenditures presented in this paper are probably accurate within reasonable estimating error limitations.

Relationship to Census Data

Census reports on education expenditures provide data on expenditures of public school systems and institutions of higher education, with intergovernmental transfers of funds identified. Data for the public sector included in this paper are consistent with Census data insofar as the reporting base is the same. Some of the expenditure accounts are not based on the same content, however, and comparison of data requires adjustments to the same base.

In higher education, for example, Census data include all expenditures of publicly operated universities, colleges, junior colleges, and other schools beyond the high school level. Gross amounts spent for auxiliary activities (dormitories, dining halls, and bookstores) are included. Excluded, however, are expenditures for agricultural experiment stations, agricultural extension services, and institutional expenditures for hospitals.

Intergovernmental payments make up a large share of Federal and State education expenditures: Federal $1,677 million and State $8,351 million (all levels in 1965). Loans are excluded in these amounts.

Census reports for 1965 higher education expenditures (in millions of dollars):[22]

State (direct)	$5,258
Local (direct)	605
Total expenditures (direct)	5,863

These amounts represent total expenditures of public institutions of higher education regardless of the source of funds. Included in the State total, for example, are funds from Federal and private sources. We estimate that totals of $1.6 billion of Federal (including loans), $0.3 billion in local, $3.1 billion in State, and $2.7 billion in funds from other sources were spent by public institutions of higher education in 1965.

The total ($7.7 billion) is higher than the Census data because it includes Federal institutions (academies), all R. & D. funds to public institutions (Census includes only part of R. & D. funds—roughly half the total we use), and the extension and other services cited previously. By starting with Census totals and adjusting for these amounts, we can reconcile totals within reasonable limits.

[21] M. M. Chambers, *Appropriations of State Tax Funds for Operating Expenses of Higher Education 1966–1967.* National Association of State Universities and Land-Grant Colleges, Washington, D.C., 1966.

[22] *Governmental Finances in 1965,* U.S. Department of Commerce, Bureau of the Census, 1966.

TABLE 23.—*Federal funds for education and related activities: Fiscal years 1966 and 1967* [1]

[Amounts in thousands]

Program by type of support and academic level	Estimated obligations	
	1966	1967
Total	$9,150,060	$10,136,441
ELEMENTARY-SECONDARY EDUCATION [2]	2,298,076	2,527,350
Support of local schools	1,972,793	2,101,967
Acquisition of equipment, OE	81,200	56,200
Assistance for educationally deprived children, OE	959,000	1,070,410
Federally impacted areas, OE	397,078	206,337
Guidance and counseling program, OE	24,494	24,500
Teacher Corps, OE	13,200	31,372
Shared revenues from public lands, Agr./Int. [3]	54,144	56,949
Indian education, Int	94,325	101,019
Economic opportunity programs, OEO [4]	310,000	515,000
Assistance in special areas [5]	39,352	40,180
Overseas schools	108,577	127,195
Education of dependents, DOD	79,100	89,900
Territories, dependencies, DOD/Int. [6]	29,477	37,295
Supporting services	201,750	281,750
Grants for school library materials, OE	100,000	105,000
State statistical services, OE	2,250	2,250
State supervision and administration, OE	7,500	7,500
Strengthening State departments of education, OE	17,000	22,000
Supplementary educational centers, OE	75,000	145,000
Other	14,956	16,438
American Printing House for the Blind, HEW	1,000	1,028
Kendall School, Gallaudet College, HEW	228	245
Job placement for high school seniors, Labor	9,728	10,665
Science education, NSF	4,000	4,500
HIGHER EDUCATION	4,351,471	4,811,100
Research and development in colleges and universities [7]	1,350,100	1,430,000
Facilities and equipment	1,210,977	1,376,082
Grants for acquisition of equipment, OE	15,000	14,500
Higher Education Facilities Act, OE	632,700	722,744
Library assistance, OE/PHS	10,000	35,500
Research facilities and equipment, OE	20,000	12,400
Health professions teaching facilities, PHS	106,792	160,000
Health related facilities, PHS	65,310	25,000
Gallaudet College-Howard University, HEW	5,493	10,043
Agricultural research facilities, Agriculture	2,000	-------
Colleges in territories, dependencies, DOD/Int	1,454	696
Center for Cultural and Technical Interchange, State	-------	250
Nuclear training equipment, AEC	1,528	919

See footnotes at end of table.

TABLE 23.—*Federal funds for education and related activities: Fiscal years 1966 and 1967* [1]—Continued

[Amounts in thousands]

Program by type of support and academic level	Estimated obligations	
	1966	1967
Facilities and equipment—Continued		
Specialized facilities, NASA	$8,000	$7,000
Specialized research facilities, NSF	27,600	30,000
Institutional science program grants, NSF	39,100	24,000
College housing loans, HUD [8]	276,000	333,000
Institutional grants	163,811	244,056
Grants for developing institutions, OE	5,000	30,000
Handicapped program, OE	720	360
Land-grant college instruction, OE	14,500	2,550
Language and area centers, OE	5,080	5,830
Strengthening teacher education programs, OE	5,000	5,000
Health training, PHS	24,482	52,500
Regional medical programs, PHS	24,000	43,000
Teaching grants, VRA	10,300	12,619
Gallaudet College-Howard University, HEW	13,271	15,584
National Technical Institute for the Deaf, HEW	323	444
State merchant marine schools, Commerce	1,600	1,635
Canal Zone College, DOD	513	606
Center for Cultural and Technical Interchange, State	2,041	2,100
D.C. Teachers College, D.C. Government	281	328
Institutional development grants, NSF	54,500	69,500
Specialized science education, NSF	2,200	2,000
Fellowships and traineeships	264,924	329,078
Foreign language and area studies, OE	2,000	3,500
Handicapped program, OE	15,653	19,373
Language development, OE	6,120	6,870
NDEA graduate, OE	55,961	81,957
Teacher, OE	15,000	37,500
Community health, PHS	18,162	20,437
Environmental health, PHS	378	468
National Institutes of Health, PHS	59,330	62,982
National Library of Medicine, PHS	20	120
Vocational rehabilitation, VRA	14,500	17,181
Water supply and pollution control, WPCA [9]	710	633
Fisheries scientist, Interior	195	195
Center for Cultural and Technical Interchange, State	3,759	3,700
Nuclear, AEC	3,355	3,852
NASA traineeship program, NASA	25,280	22,310
Science, NSF	44,501	48,000
Federal schools and training of personnel	556,209	576,176
Merchant Marine Academy, Commerce	4,683	4,470
Military Academies, DOD	138,999	135,058
Training military personnel, DOD	316,593	336,467
Coast Guard Academy and training personnel, Treasury	10,911	10,575
Special schools and courses, AEC	3,418	3,896
Training Federal employees	81,605	85,710

See footnotes at end of table.

TABLE 23.—*Federal funds for education and related activities: Fiscal years 1966 and 1967* [1]—Continued

[Amounts in thousands]

Program by type of support and academic level	Estimated obligations	
	1966	1967
Other student support	$439, 989	$457, 288
Educational opportunity grants, OE	60, 000	122, 000
Insured loan program, OE	10, 000	46, 000
Student loan program, OE	184, 850	37, 687
Work study program, OE	99, 123	134, 100
Health professions scholarships, PHS	4, 230	8, 000
Health professions student loans, PHS	33, 575	.....
Training welfare personnel, WA	15, 785	17, 770
Indian education, Interior	1, 400	2, 211
Scholarships in territories, dependencies, Interior	435	435
Veterans education programs, VA	30, 591	89, 085
Training grants	365, 461	398, 420
College library assistance, OE	1, 000	3, 750
Cuban refugee assistance, OE/WA	300	400
Handicapped program, OE	2, 287	3, 292
Institutes program, OE	40, 388	48, 106
Institutes and inservice training, civil rights, OE	8, 246	7, 673
Research training, OE	8, 000	8, 000
Community health, PHS	5, 054	5, 904
Environmental health, PHS	9, 037	12, 949
National Institutes of Health, PHS	206, 699	212, 736
National Library of Medicine, PHS	65	1, 000
Water supply and pollution control, WPCA [9]	2, 500	2, 910
Care of crippled children, WA	.....	4, 000
Child welfare, WA	5, 000	5, 500
Juvenile delinquency, WA	2, 000	3, 000
Community development, HUD	.....	2, 000
Law enforcement assistance, Justice	1, 200	2, 900
Faculty training institutes, AEC	985	1, 000
Institutes and conferences, NSF	41, 400	42, 000
Other training grants, NSF	9, 800	9, 800
Teacher training, OEO	21, 500	21, 500
VOCATIONAL-TECHNICAL AND ADULT EDUCATION	2, 317, 755	2, 600, 542
Vocational-technical training	2, 165, 856	2, 412, 47C
Vocational education grants, OE	249, 902	238, 402
Vocational student insured loans, OE	960	2, 000
Military technical, DOD [10]	1, 171, 304	1, 215, 362
Indian adult, Interior	11, 416	12, 066
Training in Federal prisons, Justice	2, 229	2, 866
Apprenticeship and training programs, Labor	7, 096	8, 397
MDTA training and subsistence, Labor/OE	365, 384	347, 000
Economic opportunity programs, OEO [11]	351, 250	539, 000
Veterans education programs, VA	6, 315	47, 377

See footnotes at end of table

TABLE 23.—*Federal funds for education and related activities: Fiscal years 1966 and 1967* [1]—Continued

[Amounts in thousands]

Program by type of support and academic level	Estimated obligations	
	1966	1967
Occupational training	$19, 370	$22, 301
Training for State welfare personnel, WA	11, 735	13, 170
Mine safety training, Interior	1, 500	1, 500
Training for law enforcement personnel, Justice	1, 736	2, 688
Nuclear training courses, AEC	491	443
VISTA training, OEO	3, 908	4, 500
Adult education	132, 529	165, 771
Civil defense program, OE/DOD	4, 200	4, 204
Community service and continuing education, OE	10, 000	20, 000
Agricultural extension service, Agriculture	89, 216	90, 224
State technical services program, Commerce	1, 500	3, 500
General prisoner education program, Justice	1, 386	1, 413
Arts and humanities assistance, NFAH	7, 727	17, 930
Adult literacy program, OEO/OE	18, 500	28, 500
OTHER EDUCATION PROGRAMS	182, 758	197, 449
Administration and services, OE/NSF [12]	60, 832	71, 843
Library services [13]	106, 688	119, 078
Educational television grants, OE	15, 238	6, 528

[1] Estimates from U.S. and agency budget documents. R. & D. estimates from National Science Foundation. Amounts for education estimated from larger budget entries in some cases. Excludes international education activities, school lunch program, and value of donated surplus property.

[2] Vocational education funds included in "Vocational-Technical and Adult Education" category.

[3] Estimated amount for schools from larger payments to States and counties.

[4] Estimates of amounts for education from Community Action and Neighborhood Youth Corps programs.

[5] Includes estimated amounts for schools from total Federal payment to District of Columbia, payments for Cuban refugee education, and payments in-lieu-of-taxes by the Atomic Energy Commission and Tennessee Valley Authority.

[6] Estimate of Federal contributions for education from larger payments for support of public services.

[7] Includes R. & D. and curriculum development grants. R. & D. estimates from National Science Foundation.

[8] Estimated Federal obligations to colleges and universities. Loan certificates will be sold to private investors resulting in significantly lower Federal expenditures.

[9] Federal Water Pollution Control Administration established in 1965. Funds previously included in Public Health Service.

[10] Estimated cost of military training programs exclusive of flight and recruit training. Higher education programs reported elsewhere.

[11] Estimates of amounts for education from Community Action, Neighborhood Youth Corps, Job Corps, and work experience programs.

[12] Includes administrative costs, information services, and surveys and studies not reported in other categories.

[13] Includes grants to public libraries; operating expense of Library of Congress, Smithsonian Institution, National Library of Medicine, and National Agricultural Library; and depository library and catalog and index activities of the Government Printing Office.

TABLE 23–A.—*Federal funds for international education: Estimates for fiscal years 1966 and 1967* [1]

[Amounts in thousands]

Program	Estimated obligations	
	1966	1967
Total	$316,679	$356,427
Educational Exchange Program, State	50,271	46,822
American sponsored and dependent schools, State	3,179	5,578
Educational allowances to Foreign Service personnel, State	1,104	1,172
Peace Corps, volunteer and project costs, PC	57,175	56,611
AID projects, AID	$111,750	$150,400
Educational allowances to USIA personnel, USIA	606	698
Educational assistance, USIA	5,294	5,146
Research and development in foreign institutions [2]	87,300	90,000

[1] Data incomplete. The Federal Government also supports education through contributions to international organizations. Assistance to foreign students under regular student support programs of the various agencies is not included in the data above.

[2] Based on latest published data of the National Science Foundation.

6. Educational Expenditures in the Seventies*

ELEMENTARY AND SECONDARY EDUCATION

Projections of Expenditures

Public elementary and secondary school expenditures may reach $44 billion in 1970 and over $57 billion in 1975.[23] An additional $4.7 billion in 1970 and $6.1 billion in 1975 will be required for private schools and for public and private special schools, such as residential schools for the handicapped.[24] These estimates provide for extended preschool programs, further improvement in pupil/teacher ratios, and all-day school programs for a third of pupils enrolled. Estimates based on alternative projections of enrollment and pupil/teacher ratios are presented below.

Variables in Projections

The principal variables affecting projected expenditures are enrollments and pupil/teacher ratios. Alternative enrollment projections are presented in table 24, below. Enrollment Projection A assumes that public elementary school enrollments will likely level off during the next decade at 31.1 million in 1970 and 29.2 million in 1975. Projection B assumes a rapid increase in preschool enrollments during the coming decade as a result of a lowering of the preschool entrance age and practically universal kindergarten programs. In this projection, elementary school enrollments of 33.9 million in 1970 and 34.5 million in 1975 may be expected.[25]

The projections assume that pupil/teacher ratios will remain at recent levels of 27.5 to 1 or, alternatively, reach a 20 to 1 level. Teacher requirements for these alternative ratios are presented in table 24.

TABLE 24.—*Projections of elementary and secondary school enrollments and teachers, 1970 and 1975*

[Numbers in millions]

Year	Public elementary school enrollment	Public secondary school enrollment	Public school teachers at—	
			Present ratio	Optimum ratio
	Projection A			
1970	31.1	13.5	1.7	2.4
1975	29.2	14.7	1.8	2.3
	Projection B			
1970	33.9	13.5	1.8	2.5
1975	34.5	14.7	2.0	2.5

These variables form the basis for the four alternative projections of expenditures for public elementary and secondary education presented in table 28.

Bases for Projections

Based on the variables discussed above and assumptions concerning salary levels, extended school services and increases in other costs, discussed under the expenditure category headings below, alternative expenditure projections by major category were made. These are presented in table 28.

These projections, as already stated, reach $43 billion in 1970 and $57 billion in 1975. Without expanded preschool services, and with maintenance of a 27.5 to 1 pupil/teacher ratio, expenditures would reach almost $36 billion in 1970 and $43 billion in 1975.

Instructional salaries.—An annual increase of 5 percent is assumed for all professional salaries. Average salaries for teachers and other professional staff for the current school year provided the base for the projections. A small improvement in the ratio of instructional staff to classroom teachers is also assumed, in line with recent trends.

Other instructional costs.—It is assumed that nonprofessional staff salaries will continue at an average level of 60 percent of teacher salaries. In addition to

[23] 1970 and 1975 as used in this report refer to the school year beginning in fall 1970 and 1975. All fiscal data are in current dollars.

[24] Estimates on private and special school expenditures from U.S. Office of Education, *Projections of Educational Statistics to 1975–76.*

[25] Additional details on enrollment projections are presented in ch. 2, *Projections of School and College Enrollments: 1970 and 1975*, p. 7.

* *Prepared by Penrose B. Jackson, Office of Program Planning and Evaluation, U.S. Office of Education.*

salaries for clerical and secretarial personnel, salaries for teacher aides are included on the assumption that 30 percent of pupils enrolled in preschool through grade three need the improved program that can be provided by use of aides for their teachers. A teacher aide would be provided for each preschool teacher and for every two teachers in grades one to three. Other costs in this category assume a 3.4 percent per year increase due to rising costs for classroom instructional materials and for additional requirements for such materials.

Other pupil costs.—Personnel costs for health, transportation, food and attendance services rise, in these projections, an average of 3.1 percent per year and other costs increase at a 1.5 percent rate. In addition, a 5-percent increase by 1970 and a 10-percent increase by 1975 over current year expenditures for health services personnel are provided.

Operation and maintenance of plant.—An annual 5-percent increase in per pupil costs for plant operation and maintenance is assumed, based on trends in such costs in recent years. This increase is for both personal services and other costs, such as utilities. Improved pupil/teacher ratios, with the required additional classroom units, would increase costs an estimated 10 percent above this level.

Administration.—An average annual increase of 4.7 percent for personal services (professional and clerical) and a 1.5 percent annual increase for other costs are assumed.

Other current costs.—Other current costs include summer school, adult education, and community services. We have assumed summer school programs for one-third of total enrolled students at a cost of 25 percent of average costs per pupil in regular school programs. Adult education and community service expenditures will, it is assumed, double by 1970 and double again in the following 5 years.

Extending the school day.—It is assumed that after-school programs will serve 30 percent of enrolled pupils at a cost of one-third that for average cost per pupil in average daily attendance in regular day programs.

Capital outlay.—It is assumed that construction at the 1965–66 rate of almost 70,000 rooms a year ought to suffice for public elementary and secondary school needs, including the elimination of substandard and overcrowded classrooms. If extra preschool enrollment is included, an additional 20,000 or 25,000 rooms a year, costing from $1 to $1.2 billion, may be needed in the period 1970 through 1975.

Interest.—Interest requirements are based on data from *Projections of Educational Statistics to 1975–76,* National Center for Educational Statistics, U.S. Office of Education.

Analysis of Increased Costs

Projection B in table 28 assumes a large increase in preschool programs for 3- and 4-year-olds and practically universal kindergarten programs for 5-year-olds. Distribution between public and private schools was made on the basis of current enrollment patterns.

Increased costs for public elementary and secondary education are due to rising costs for personal services and for other services, to new and expanded programs, and to changes in enrollments and in class size. The increases in expenditures from 1965 to 1970 and from 1965 to 1975 are assigned to these factors in table 25.

TABLE 25.—*Increases in current expenditures for public elementary and secondary education, 1965 to 1970 and 1965 to 1975*

[Amounts in millions]

Increase due to	Increase 1965 to 1970		Increase 1965 to 1975	
	Present ratio	Optimum ratio	Present ratio	Optimum ratio
Total.....	$12,426	$18,620	$22,021	$30,248
Enrollments....	2,194	6,272	3,865	8,172
Rising costs....	5,078	6,801	12,409	15,813
Improved services.....	5,154	5,547	5,747	6,263

Enrollments.—An enrollment increase of 5.3 million pupils from 1965 to 1970 will result in a $2.2 billion increase in costs assuming the maintenance of the present pupil/teacher ratio of 25 to 1. Should the more favorable ratio of 20 to 1 be achieved, the increase in costs during this period would be $6.3 billion.

The category of instructional salaries is affected most by rising enrollments. Assuming the low pupil/teacher ratio, instructional salaries account for three-fourth's of the costs due to increased enrollments from 1965–70, decreasing to 65 percent when the 10-year period is considered.

Rising costs.—Increases due to higher cost trends account for slightly less than two-fifth's of total growth from 1965 to 1970 under both pupil/teacher ratios, increasing to just over half of total growth when the entire 10-year period is considered.

Assuming the maintenance of a 27.5 to 1 pupil/teacher ratio, expenditures due to rising costs would reach $5.1 billion above the 1965 level by 1970 and

$12.4 billion by 1975. The largest share of the $5.1 billion, three-fourths of the total, is due to increases in instructional salaries, with increases in costs of plant operation and maintenance accounting for $0.5 billion. Of the $12.4 billion increase due to rising costs in 1975, major increases are due higher instructional salaries ($8.6 billion), plant operation and maintenance ($1.5 billion), and other pupil costs ($1 billion).

Assuming a more favorable pupil/teacher ratio of 20 to 1, expenditure increases due to rising costs would reach $6.8 billion between 1965 and 1970 and $15.8 billion from 1965 to 1975.

Improved services.—The substantial growth in current expenditures due to improved services between 1965 and 1970 is due primarily to the new compensatory elementary and secondary education programs. Assuming the maintenance of the present pupil/teacher ratio, expenditures due to improved services would reach $5.2 billion during this period. Under both time periods examined, $704 million is needed for the salaries of teacher aides at the low ratio. If, however, the optimum pupil/teacher ratio is assumed, $968 million of the $5.5 billion allocated for improved services will be needed for salaries of teacher aides. These projections provide for the services of one teacher aide for every preschool teacher as well as one aide for every two teachers in grades one through three.

A major expansion of summer school programs to include one-third of the school population, and expanded adult education and community service programs account for $1.6 billion of improved services during the first time period and $2.1 billion during the second. The new programs involved in extending the school day account for another major addition of close to $2.8 billion.

Some modest expansion of health services in the category of other pupil costs contributes to increases in expenditures due to improved services. Regardless of the pupil/teacher ratio assumed, $16 million is needed during the 1965–70 period and $31 million during the 10-year period.

HIGHER EDUCATION

Projections of Expenditures

Expenditures of public and private higher education institutions may reach $23 billion in 1970 and just over $35 billion in 1975. These estimates are based on enrollment and student/faculty ratio projections of the Office of Program Planning and Evaluation.[26] These and alternative projections are presented in table 29.

Variables in Projections

Enrollment and faculty supply projections are the principal variables in these projections of educational expenditures. Enrollment projections are based on alternative assumptions regarding the socioeconomic status and achievement level patterns of the college population in the future. Projection A assumes a continuation of the present (1965–66) socioeconomic composition of the student population. Projection B, the higher projection, assumes a change in the enrollment pattern (see table 26). This projection assumes the elimination of financial and motivational obstacles, which would enable more students from lower socioeconomic status levels to attend college. For each of the projections, expenditures are estimated assuming alternative student/faculty ratios. The low faculty projection assumes that the student/faculty ratio will continue its present trend through 1975. The high faculty projection assumes the student/faculty ratio can be reduced to its 1959 level of 13.5/1 (see table 27).

TABLE 26.—*Higher education enrollments*

[Numbers in thousands]

Year	Full-time equivalent students	
	Projection A	Projection B
1970	6,240	6,644
1975	7,515	7,928

TABLE 27.—*Higher education faculty supply*

[Numbers in thousands]

Year	Faculty supply (full-time equivalent)			
	Trend student/staff ratio		Improved student/staff ratio	
	Low enrollment	High enrollment	Low enrollment	High enrollment
1970	400	426	462	492
1975	450	480	555	588

[26] See Chapter 4, *The Demand and Supply of Instructional Staff in Higher Education*, p. 17.

Analysis of Expenditure Projections

Projected expenditures in table 29 present two alternatives for each of the enrollment projections, based on the alternative student/staff ratios previously discussed. Expenditures in 1970 with low enrollment estimates range from $20.8 billion with a low faculty supply to $21.9 billion with the higher faculty supply. By 1975, expenditures would range from $31 billion to $33.6 billion.

With the higher expected enrollments and the low faculty supply, expenditures would reach $21.8 billion in 1970 and $32.4 billion in 1975; with the higher faculty supply, they would reach $23 billion in 1970 and $35.1 billion in 1975.

Total current expenditures.—Projections of current expenditures vary with the number of students and faculty supply. They range from $18.3 billion in 1970, with low enrollment/low faculty supply assumed, to $28.5 billion in 1975. With low enrollment/high faculty supply, expenditures would be $19.4 billion in 1970 and $31.1 billion in 1975.

With the higher expected enrollments and low faculty supply, expenditures would be $19.3 billion in 1970 and $29.9 billion in 1975; with the higher faculty supply, the totals are $20.5 billion in 1970 and $32.6 billion in 1975.

Faculty salaries.—Faculty salaries are projected on the assumption that the annual rate of increase, 6.2 percent in recent years, will continue at a 5.5 percent rate in the period 1970–75. The low faculty supply/low enrollment projections would then result in faculty salary expenditures of $4.6 billion in 1970 and $6.8 billion in 1975; the higher faculty supply projections would cause costs to rise to $5.4 billion in 1970 and $8.5 billion in 1975.

These projections are based on two alternative assumptions concerning faculty supply. The lower projection assumes a continuation of the trend of student/faculty ratio. The higher projection assumes a more favorable student/faculty ratio (13.5/1). An average salary base of $12,912 is used for 1970 and $16,875 for 1975. In all of the alternatives faculty salaries represent approximately 50 percent of student education costs and from 24 to 28 percent of total current expenditures.

Other instructional costs.—Other costs associated with instruction, including nonfaculty salaries in instructional departments, are assumed to increase in proportion to expenditures for faculty salaries. In the period 1956–66, faculty salaries have constituted a fairly constant proportion of expenditures for instruction (about 85 percent), and it is assumed this relationship will continue. The higher rate of increase for faculty salaries over other salaries would be offset by requirements for additional nonfaculty personnel and instructional materials requirements.

Administration, libraries, operation and maintenance of plant.—Other components of the student education category are assumed to increase in line with trends of the past decade in expenditures per pupil.

Student education, total.—The concept of student education employed here includes funds for administration, instruction, library services, and plant operation and maintenance. Organized research and extension services funds are excluded. Overhead for research and extension services, estimated at a modest 15 percent and 5 percent, respectively, are also excluded. Expenditures per student will thus be lower than those shown in other sources that include all education and general expenditures as student education (these include the items excluded above).

Organized research.—Organized research funds are projected at an annual increase of 8 percent.

Related activities, auxiliary services.—Expenditures for activities related to instructional departments (such as medical school hospitals or testing laboratories conducted primarily for the purposes of professional training of students) and auxiliary services (cafeterias, residence halls, student unions) are assumed to increase in proportion to enrollments and in line with trends over the past decade in expenditures per student.

Extension services, student aid.—Expenditures for extension services and student aid (includes fellowships, scholarships; excludes student loans and employment) are assumed to increase in line with trends of the past decade with additional growth from some expansion of Federal assistance.

Plant funds.—Plant funds will decrease somewhat and level off at about $2.5 billion annually by 1970 and continue at this level through 1975 in these projections.

TABLE 28.—*Elementary and secondary education expenditures, projections to 1970 and 1975* [1]

[Amounts in millions]

Expenditure category	Excluding extra preschool (Projection A)				Including extra preschool (Projection B)			
	Present pupil/teacher ratio		Optimum pupil/teacher ratio		Present pupil/teacher ratio		Optimum pupil/teacher ratio	
	1970	1975	1970	1975	1970	1975	1970	1975
TOTAL	$36,169	$43,449	$41,769	$50,533	$38,279	$48,984	$43,412	$57,211
Current	31,608	38,778	37,208	45,862	33,718	43,313	39,912	51,540
Instructional salaries	16,415	21,003	21,454	27,272	17,360	23,032	22,729	30,076
Teachers	14,509	18,449	18,958	23,919	15,342	20,198	20,032	26,365
Other salaries	1,906	2,554	2,496	3,323	2,018	2,834	2,647	3,711
Other instructional costs	2,076	2,567	2,278	2,845	2,335	3,181	2,773	3,764
Personal services	1,013	1,329	1,215	1,607	1,205	1,794	1,643	2,377
Other	1,063	1,238	1,063	1,238	1,130	1,387	1,130	1,387
Other pupil costs	4,157	4,638	4,157	4,638	4,417	5,192	4,417	5,192
Personal services	2,496	2,876	2,496	2,876	2,652	3,218	2,652	3,218
Other	1,661	1,762	1,661	1,762	1,765	1,974	1,765	1,974
Operation and maintenance of plant	3,065	3,851	3,371	4,236	3,257	4,316	3,483	4,747
Personal services	1,471	1,733	1,594	1,887	1,564	1,942	1,694	2,115
Other	1,594	2,118	1,778	2,349	1,694	2,374	1,889	2,633
Administration	926	1,114	926	1,114	1,078	1,374	1,078	1,374
Personal services	743	920	743	920	888	1,169	888	1,169
Other	183	194	183	194	190	205	190	205
Other current costs	2,342	2,940	2,342	2,940	2,481	3,242	2,481	3,242
Personal services	1,747	2,205	1,747	2,205	1,861	2,432	1,861	2,432
Other	595	735	595	735	620	810	620	810
Extending school day	2,627	2,665	2,680	2,817	2,790	2,976	2,851	3,145
Elementary	1,767	1,697	1,804	1,783	1,930	2,008	1,975	2,111
Secondary	860	968	876	1,034	860	968	876	1,034
Capital outlay	3,500	3,500	3,500	3,500	3,500	4,500	3,500	4,500
Interest	1,061	1,171	1,061	1,171	1,061	1,171	1,061	1,171

[1] School year 1970–71 and 1975–76. Amounts in current dollars.

NOTE: Detail may not add to totals because of rounding.

TABLE 29.—*Higher education expenditures, projections to 1970 and 1975* [1]

[Amounts in millions]

Expenditure category	Projection A—Low enrollment				Projection B—High enrollment			
	Low faculty supply [2]		High faculty supply [3]		Low faculty supply [2]		High faculty supply [3]	
	1970	1975	1970	1975	1970	1975	1970	1975
Total expenditures	20,750.0	30,958.3	21,927.3	33,563.9	21,753.9	32,416.3	23,007.1	35,096.4
Current expenditures	18,250.0	28,458.3	19,427.3	31,063.9	19,253.9	29,916.3	20,507.1	32,596.4
Student education	9,035.7	13,828.8	10,213.0	16,434.4	9,681.3	14,784.8	10,934.5	17,464.9
General administration	1,807.1	2,765.8	2,042.6	3,286.9	1,936.3	2,957.0	2,186.9	3,493.0
Instruction	5,423.3	7,973.9	6,265.1	10,058.4	5,818.2	8,569.4	6,820.8	10,713.5
Faculty salaries	(4,609.8)	(6,777.8)	(5,410.3)	(8,549.6)	(4,945.5)	(7,284.0)	(5,797.7)	(9,106.5)
Other	(813.5)	(1,196.1)	(954.8)	(1,508.8)	(872.7)	(1,285.4)	(1,023.1)	(1,607.0)
Libraries	658.7	1,324.9	658.7	1,324.9	704.3	1,395.3	704.3	1,395.3
Plant operation and maintenance	1,146.6	1,764.2	1,146.6	1,764.2	1,222.5	1,863.1	1,222.5	1,863.1
Organized research	3,699.3	5,435.5	3,699.3	5,435.5	3,699.3	5,435.5	3,699.3	5,435.5
Related activities	904.1	1,359.5	904.1	1,359.5	963.4	1,435.0	963.4	1,435.0
Extension	879.6	1,769.1	879.6	1,769.1	936.8	1,863.1	936.8	1,863.1
Auxiliary services	2,892.6	4,450.6	2,892.6	4,450.6	3,082.8	4,693.4	3,082.8	4,693.4
Student aid	838.7	1,614.8	838.7	1,614.8	890.3	1,704.5	890.3	1,704.5
Plant	2,500.0	2,500.0	2,500.0	2,500.0	2,500.0	2,500.0	2,500.0	2,500.0

[1] Refers to academic year 1970-71 and 1975-76. All fiscal data are in current dollars.

[2] Assumes a continuation of the trend in student/faculty ratio.

[3] Assumes a lower student/faculty ratio of 13.5/1.

NOTE: Details may not add to totals because of rounding.

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