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ABSTRACT

This memo contains a comprehensive review of past, present, and likely future conditions related to the supply and demand situation of public school teachers. Primary emphasis is placed on the quantitative rather than the qualitative aspects of the teacher supply and demand picture. Section I summarizes and presents highlights of findings on: (1) supply of qualified teachers; (2) demand for public school teachers; (3) actual demand for new teachers; (4) personnel requirements for achieving minimum quality levels; (5) teacher supply compared to demand; and (6) outlook for teacher supply and demand in the 1980's. Section II contains detailed information, including tables, elaborating on, and pertaining to, the procedures, assumptions, sources, statistics, and limitations involved in developing the findings reported in the memo. Strong evidence is presented that the major key to solving the quantitative and qualitative problems of teacher supply and demand is to improve the attractiveness of teacher salaries and working conditions. (JD)

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Teacher Supply and Demand in Public Schools, 1981-82

TEACHER SUPPLY AND DEMAND IN PUBLIC SCHOOLS, 1981-82

William S. Graybeal
Project Director

FOREWORD

National attention continues to be drawn to the problems of attracting and holding qualified teachers in the public schools. Despite an overall surplus of college graduates throughout the nation there are reports of severe shortages of teachers for some assignments and there is growing evidence that employment in teaching is not attractive to the quality of college graduates needed for effective schools.

This Memo reviews the status and trends in each of many factors relating to teacher supply and demand conditions. It gives estimates of the present status of teacher supply and demand in terms of both the actual number of jobs opened to new teachers and the number of jobs that would need to be opened to immediately raise to minimum levels the quality of public school programs and services. It contains data underlying these estimates so that the user may apply other assumptions in studying the problem.

The material is grouped into two sections—the first contains a summary of the major findings while the second reviews the assumptions and estimates underlying the findings and gives the specific data supporting them.

This report supplies strong evidence that the major key to solving the quantitative and qualitiative problems of teacher supply and demand is to improve the attractiveness of teacher salaries and working conditions. This Memo is issued to support Association actions at all levels to achieve these critically needed improvements.

This 34th annual study of teacher supply and demand has been prepared with invaluable assistance from persons in colleges and universities and in states departments of education who supplied most of the basic data. William S. Graybeal, the project director, was assisted by Nancy Chow, Computer Applications Programmer, Frieda Morgan, Statistical Assistant, Gloria Brantley, Office Assistant, Barbara Bohrer, Copy Preparation Assistant, and members of the NEA Data Processing staff.

W. Frank Masters, Jr.
Director
NEA Research

August 1983

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HOW TO READ THIS REPORT

FIRST: Read the introduction to get an overview of the contents and their limitations.

SECOND: Look at the charts, and review the summaries of major findings located in Section I. These cover estimates of present conditions and show them in the context of past observations and future projections. Note the reference marks following the summary statements for which you wish to have supporting information. Statements related to supply are earmarked "**S**," "**D**," and those involving both by "**SD**." Each reference mark is numbered in order of occurrence.

THIRD: Go to the text and tables of Section II that contain the information, estimates, assumptions, sources, and limitations of the findings in Section I. The numbered **S** and **D** reference marks tie the subsections to the summary statements in Section I. These subsections and tables will help you become better informed about the topic of this memo, evaluate its conclusions, and experiment with outcomes based upon new assumptions and/or better data.

INTRODUCTION

This Research Memo contains a comprehensive review of the past, present, and likely future conditions of the supply of and demand for public school teachers. It also deals with various factors that may influence the levels of either teacher supply or demand.

This report is directed to several audiences, ranging from students considering a teaching career to Association staff and leadership to researchers and public policymakers.

In order to both quickly communicate highlights of the contents to busy readers and ensure ready availability of detailed findings to users needing greater depth or identification of sources, the material is divided into two sections:

- Section I contains charts and brief statements of major points about the current status of teacher supply and demand, along with a review of some of the conditions influencing present and future supply or demand. In addition to providing a brief summary of basic facts and estimates, the charts and statements should assist users of the report in communicating the findings to others.
- Section II contains detailed information, including tables. These data elaborate on, and supply supporting information pertaining to, the procedures, assumptions, sources, statistics, and limitations involved in developing the findings. The material here will help the user evaluate the validity of the conclusions, experiment with variations on the assumptions, verify the supporting data, and explain to others the strengths and limitations of the study.

SCOPE: This Memo primarily emphasizes the quantitative rather than the qualitative aspects of the teacher supply and demand picture. Its qualitative dimension is built upon an assumption that any or all graduates meeting the minimum requirements for certification to teach may be counted in the teacher supply.

However, recent reports of deterioration in the quality of college graduates generally—and of those prepared to teach, specifically—show that greater attention will need to be given to this aspect of teacher supply and demand in future reports. A number of observations support this hypothesis that the quality of teacher-education graduates applying for teaching jobs has been declining. A major consideration for many of the most talented graduates is almost surely the recent decline in the attractiveness of salaries and working conditions in teaching as compared to those of other careers open to such graduates.

Also, the proportion of 20- and 21-year-olds enrolled at higher education institutions has increased from 19.4 percent in 1960 to 32.6 percent in 1980. This suggests that there is a wider range of intellectual capacity among the graduates in 1980 than in earlier years. Assuming that economic as well as personal satisfactions motivate graduates in the selection of a career field, it seems plausible that those applying for teaching jobs may be increasingly drawn from among lower-quality rather than higher-quality graduates.

LIMITATIONS: Data of the validity and reliability needed to make completely accurate estimates of the past, present, and future levels of teacher supply demand are not available. And while various socioeconomic considerations are believed to influence these levels, the information or formulae necessary for determining such a relationship—or the past, present, or future degree of impact of these socioeconomic factors—are unavailable.

Thus, this Memo contains estimates of varying validity and accuracy. Those of limited precision are included to present a beginning point for further investigation and verification. The concepts and estimates involved in these questionable statistics must be considered in viewing supply-demand issues, and an approximate estimate is arguably better than no estimate at all. The discussion section of this Memo identifies the sources and the approximate quality of the estimates.

SECTION I — SUMMARY AND HIGHLIGHTS

Part 1: THE SUPPLY OF QUALIFIED TEACHERS

- The stock, or total population, of persons prepared to teach includes present and former teachers plus those who never entered teaching. The number who are teaching or are seeking teaching jobs is influenced by a variety of conditions. Some of these include:
  - Attractiveness of teaching jobs compared with other employment opportunities on the basis of such criteria as beginning salaries, outlook for career salaries, working conditions, morale, location, and job security.
  - Availability of teaching jobs compared with other employment having comparable salary, working conditions, career outlook, occupational status, etc.
  - Individuals' awareness of the availability and attractiveness of jobs in teaching.
  - Individuals' degree of satisfaction and security with their present employment status compared with the likely satisfaction to be experienced in available teaching positions. **S1**

- As of fall 1981, about 6.1 million persons aged 21 to 65 years had completed the minimum requirements for certification as public school teachers (see Chart A). The persons in this pool seem to be divided into three approximately equal subgroups: those teaching in 1980-81, former teachers, and those who have not taught in public schools. The graph shows the estimated distribution of persons in this total labor pool by their past employment status as teachers and by their present labor-force status. Only the numbers in the following categories are based upon acceptably accurate data: the total number, those teaching in 1980-81, the 1981 graduates prepared to teach, and the number of former teachers in the labor reserve. **S2**

- Each year during the 1970's, the supply of new college graduates exceeded the number of job openings in occupations normally entered by college graudates. The U.S. Department of Labor reports that "in 1980, a surplus of college graduates estimated at 3.8 million was already in the labor force, either employed in jobs that did not require their level of education or unemployed." It projects that the employment market for college graduates in the 1980's will be not unlike that experienced in the 1970's. Depending on the rate of economic growth, the department esimates that the supply of college graduates during the 1980's will exceed by two to three million the number of openings in jobs normally entered by college graduates. (Jon Sargent, "The Job Outlook for College Graduates During the 1980's" *Occupational Outlook Quarterly*, Summer 1982, pp. 3-7.)

- The number of graduates completing preparation to enter public school teaching in 1981 (140,639) is smaller by 2.3 percent than the number reported for 1980 (see Chart B). This is the ninth consecutive year that the number of graduates prepared to enter teaching has decreased from the all-time high of 317,254 in 1972. **S3**

- Depending on teacher demand, market conditions in other occupations normally entered by college graduates, and attractiveness of jobs in teaching, the number of future graduates prepared to teach will vary. The graph (Chart B) shows projected numbers remaining near 1981 levels if present conditions continue but rising if attractive teaching jobs become more widely available. **S4**

CHART A – TOTAL POPULATION OF PERSONS PREPARED TO TEACH, AGED 21-65, FALL 1981.

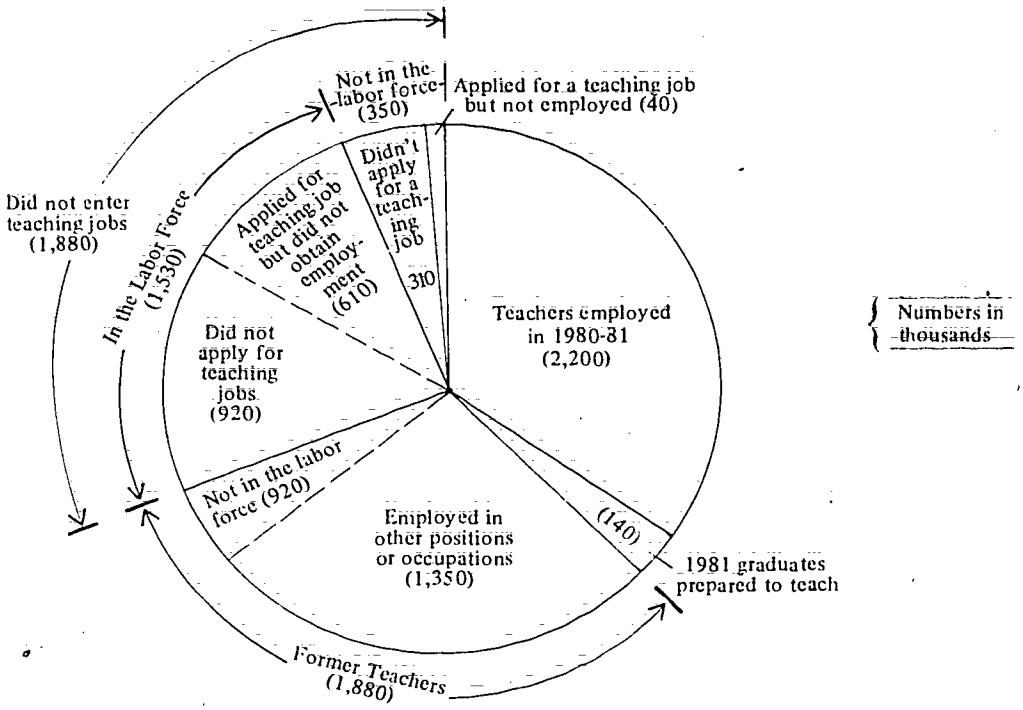
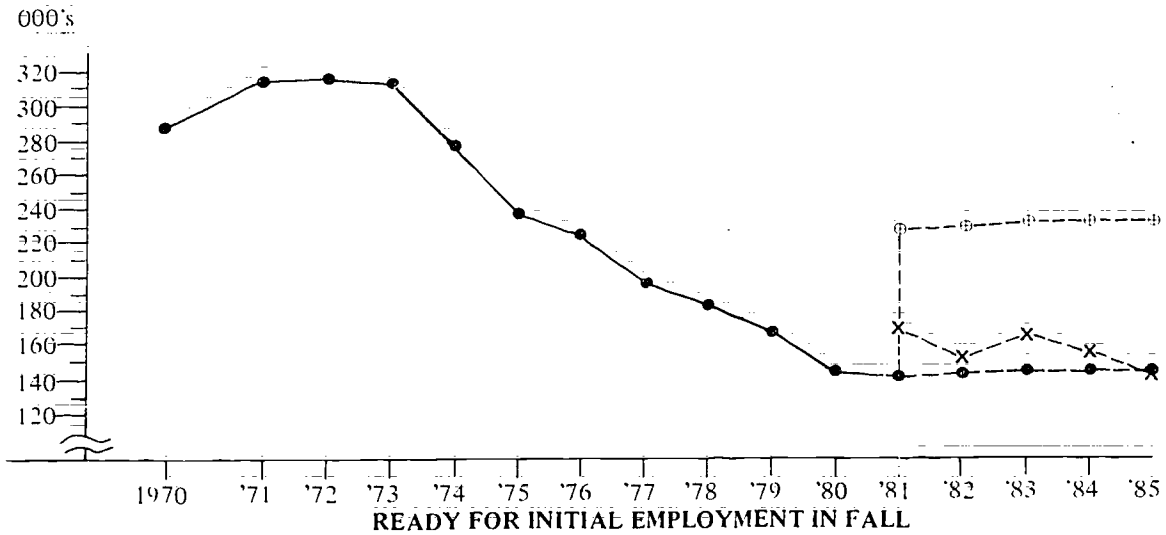


CHART B – NUMBER OF GRADUATES COMPLETING PREPARATION TO TEACH IN PUBLIC SCHOOLS, 1970-1985.



- Projected that 1981 proportion of total graduates who prepare to teach will continue.
- x Projected from freshman intent statistics.
- Projected that the 1976 proportion of total graduates prepared to teach will return in 1982 (22.5%).

- There were 206,750 applicants for teaching jobs in fall 1981. Slightly more than half of these (108,950) came from the 1981 graduating class; and the remaining 97,800 from other sources (largely the labor reserve of former teachers). **S5**

- Beginning salaries for public school teachers are not competitive with salaries offered to comparably prepared bachelor's degree graduates by private industry. Also, among employed new graduates, the average salaries of those entering teaching are lower than those of persons entering all but one other major discipline grouping. **S6**

- Beginning salaries in teaching were even less competitive with private industry salary offers to college graduates in 1981 than they were in 1975 (see Chart C). Beginning salaries for public school teachers with a bachelor's degree increased by 45.6 percent between 1975 and 1981 while beginnning salaries offered by private industry to new graduates with a bachelor's degree increased by 69.0 percent for the subject field having the highest average salary offers and by 59.3 percent for the subject field having the lowest average salary offers. **S7**

- Average salaries paid in 1980-81 to public school teachers with a bachelor's degree ($15,128) were lower (see Chart D) than the mean 1980 earnings of all full-time workers with four years of college ($22,832). Mean salaries paid in 1980-81 to public school teachers with a master's or higher degree ($18,710) were also lower than the mean 1980 earnings of all full-time workers with five or more years of college ($27,628).

- Salaries paid to public school teachers are keeping pace with salaries paid to other, comparably prepared workers. Mean teacher salaries increased between 1975-76 and 1980-81 by 37.8 percent for those having the bachelor's degree and by 36.5 percent for those having the master's degree. Between 1975 and 1980, the mean earnings of full-time workers with four years of college increased by 44.6 percent; earnings of those with five or more years of college increased by 40.0 percent.

- In 1981-82, the average salary paid to *all* public school teachers in each of 27 states was lower than the average *starting* salary of $18,600 offered by private industry for bachelor's degree graduates in *mathematics* (see Chart E). In 1975, this average private-sector starting salary offer was higher than the average salary paid to all teachers in only 20 states.

- More than one-third of public school teachers in 1980-81 (36 percent) indicated that they probably or certainly would not become teachers again if they could go back to their college days and start over (see Chart F). In three quinquennial surveys prior to 1975-76, no more than one in eight teachers (under 12.6 percent) expressed this evidence of low morale.

SUMMARY: A large number of persons not now in teaching jobs have completed the requirements for certification as public school teachers. The number of new graduates completing preparation to teach has been decreasing each year since 1972. The attractiveness of jobs in teaching has decreased during the 1970's in relation to both salaries and job satisfaction. The number of graduates prepared to enter teaching is likely to increase if the teacher job market improves.

Part 2: THE DEMAND FOR PUBLIC SCHOOL TEACHERS

- The demand for teachers (the number needed) may be viewed from two perspectives: the number that will be employed in a given year (actual demand), and the number that would have to be employed in a given year to immediately raise the quality of school programs and services (quality demand).

CHART C – BEGINNING SALARIES OFFERED TO BACHELOR'S DEGREE GRADUATES BY SCHOOL SYSTEMS AND BY PRIVATE INDUSTRY.

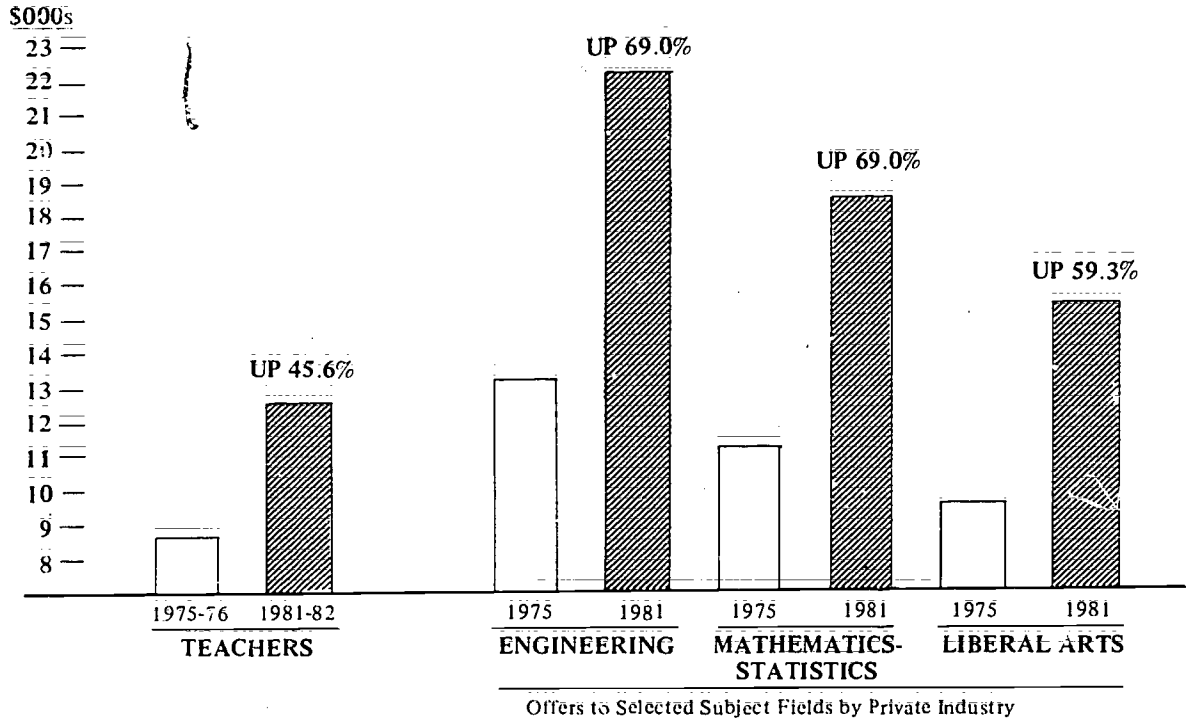


CHART D – MEAN SALARIES OF PUBLIC SCHOOL TEACHERS AND MEAN EARNINGS OF ALL COLLEGE-EDUCATED WORKERS.

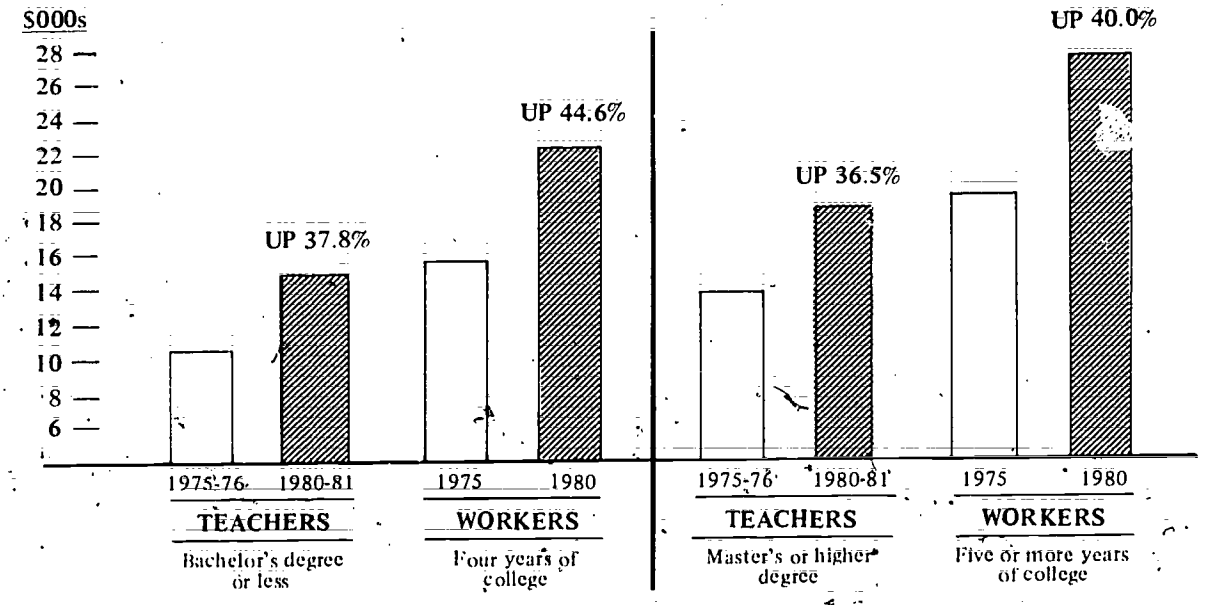


CHART E – THE 27 STATES IN WHICH THE AVERAGE 1981-82 SALARY PAID TO ALL PUBLIC SCHOOL TEACHERS WAS LOWER THAN THE MEAN SALARY OFFERED BY PRIVATE INDUSTRY TO 1981 BACHELOR'S DEGREE GRADUATES IN MATHEMATICS.

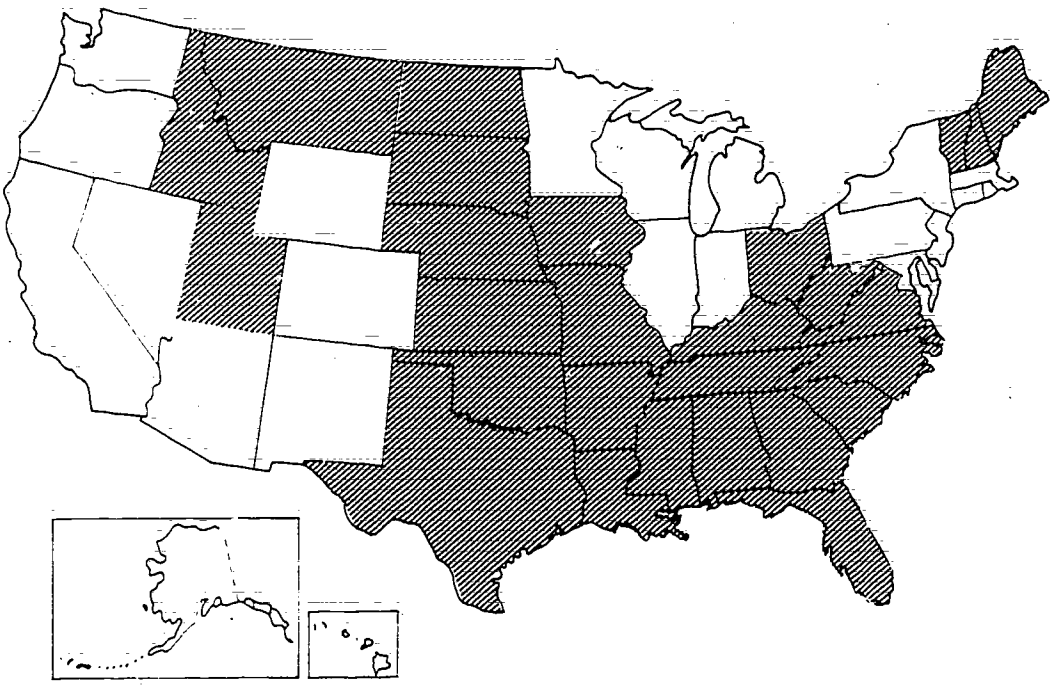
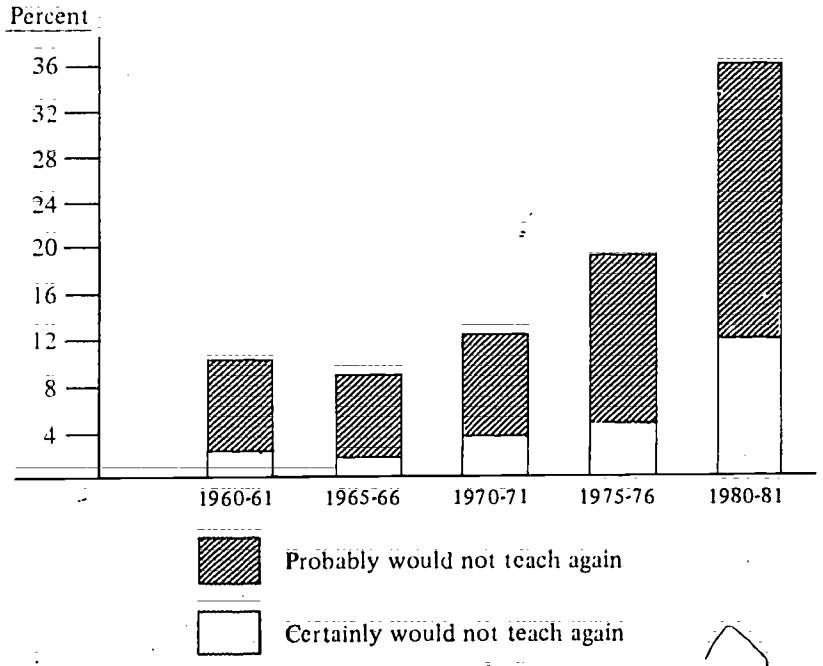


CHART F – TEACHER JOB SATISFACTION–PERCENT OF TEACHERS REPORTING THAT THEY CERTAINLY OR PROBABLY WOULD NOT TEACH IF THEY COULD START OVER.



- ACTUAL DEMAND

  — The demand for new teachers (defined here as persons not teaching the preceding year) is determined by the change in the total number of teachers that will be employed and the number of positions vacated by teachers leaving the profession at the end of the previous school year.

  - The total number of teaching positions decreased by 27,000 in the fall of 1981. (It is projected to have decreased by 36,000 positions in fall 1982. After remaining at approximately the fall 1982 level for about three yeras, the number is projected to increase for several years.) **D1**
  - The number of teaching positions opened by the (normal) departure of teachers employed in 1980-81 was 136,550. This is based on an estimate that the rate of normal teacher departures (those leaving teaching employment for at least one year) is 6.2 percent of the total teaching staff. **D2**
  - Subtracting the decrease in teaching positions from the number of departures produces an estimated demand for 109,550 new teachers in fall 1981. Based on the same type of assumptions, 98,900 to 115,650 positions were filled by new teachers in the fall of 1982. **D3**

  — Jobs for new teachers are filled primarily by beginning teachers (new graduates prepared to teach) and by experienced teachers returning to active employment (reentering teachers). Some positions are filled by persons who completed preparation to teach before the current year but did not enter teaching or by persons who have neither prepared to teach nor had teaching experience. The proportions of new beginning teachers and persons in the other categories are difficult to estimate accurately. **D4**

  - It is estimated that 76,550 beginning teachers from the 1982 graduating class gained employment as teachers in fall 1981.
  - Therefore, 33,000 positions were filled in fall 1981 by experienced former teachers reentering the profession, by persons who had never taught but were prepared, or by those who had neither preparation nor experience. This is based on an assumption that new teachers from these categories comprised 1.5 percent of the total teaching staff in 1980-81. That assumption supports the estimate that beginning teachers were employed for about 70 percent of the positions to be filled.

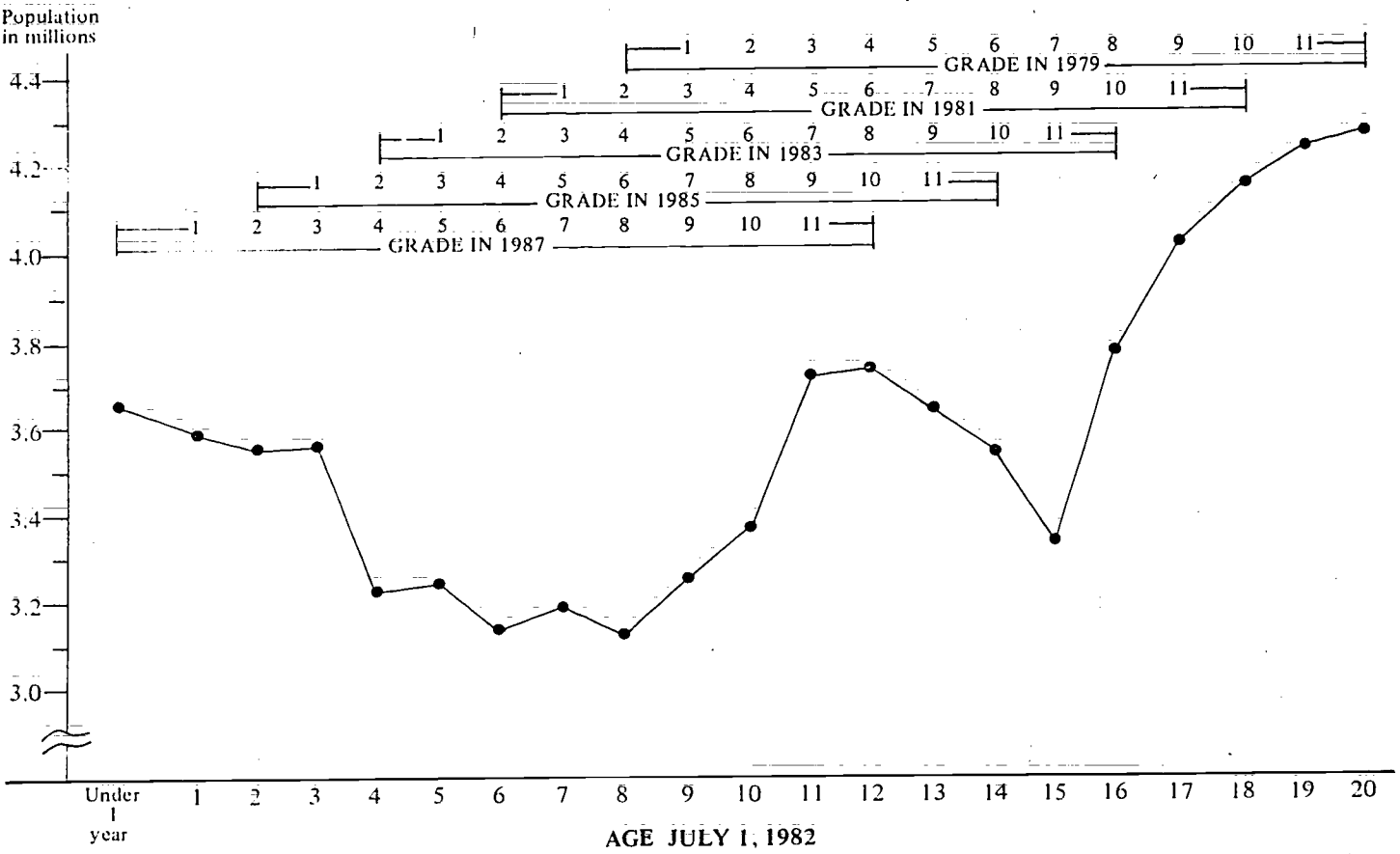
  — Continuing student enrollment declines will occur for at least through 1987-88 at all public school levels except the primary grades, where enrollment will return to 1979 levels by about 1987 (see Chart G). The number of teachers expected to reach retirement age each year will not increase during this period (see Chart H). This means that the overall numbers of new teachers needed during each of the next six years, will not increase markedly unless there are unusual increases in the numbers of teachers leaving the profession and/or in the numbers of positions created to improve the quality of schools. **D5**

- QUALITY DEMAND

  — If school programs and services were raised to minimum quality levels immediately, significant numbers of new teachers would be needed to fill the resulting additional positions that would be opened. Normally, any progress toward improving schools takes place gradually. However, the following estimates are based on the personnel requirements for expediting the achievement of minimum quality levels. **D6**

  — Fairly accurate estimates are possible of the numbers of new teachers needed for the following specific avenues to school improvement, and these alone would create 426,850 teaching position vacancies.

CHART G – POPULATION BY AGE IN 1982 AND GRADE LEVEL IN WHICH EACH AGE WILL NORMALLY ENROLL, FALL 1979 THROUGH FALL 1987.



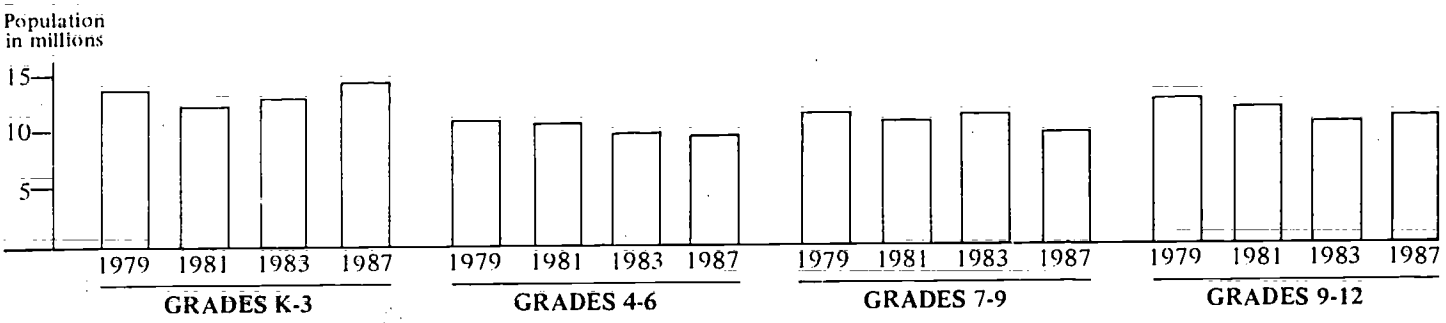


CHART H – PERCENT OF ALL TEACHERS WHO ARE AGED 40-49 OR AGED 50 OR OVER.

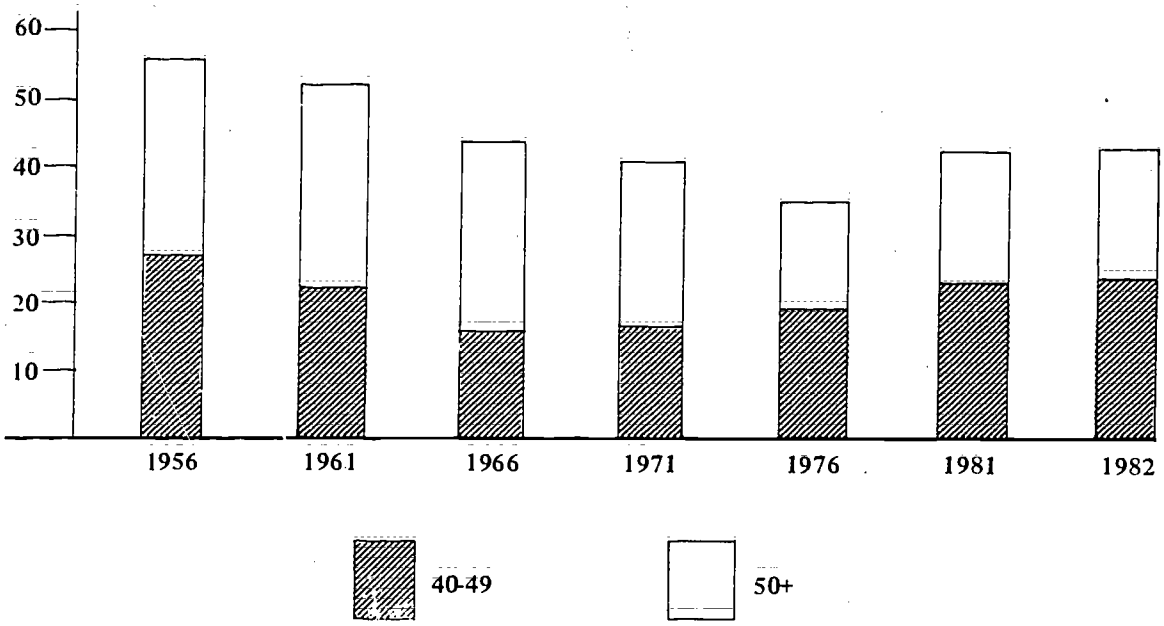
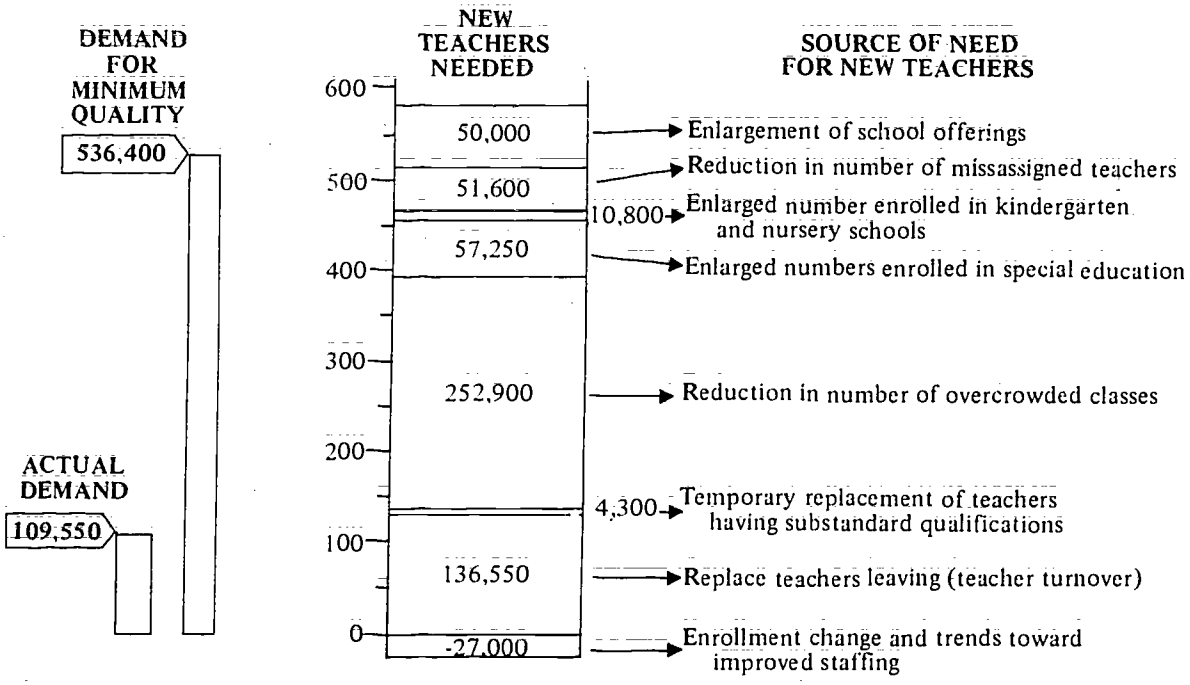


CHART I – COMPARISONS OF ACTUAL AND QUALITY DEMANDS FOR NEW TEACHERS, FALL 1981.



- 4,300 new teachers—temporarily replace teachers having substandard qualifications. **D7**
- 252,900 new teachers—reduce maximum class size to 25 students. **D8**
- 57,250 new teachers—expand special-education services to all students needing them. **D9**
- 10,800 new teachers—provide kindergarten/nursery school for five- and six-year-olds in the same proportion as seven-to-nine-year-olds are enrolled in school. **D10**
- 51,600 new teachers—replace for reassignment the teachers who are teaching outside their major field of preparation. **D11**
- 50,000 new teachers—expand or reinstate school programs or subjects to allow enrolment in fine and practical arts courses of students in all school systems. **D12**

—Creation of additional teaching positions would be required to ensure the following improvements. The numbers needed are not possible to estimate accurately.

- New teachers to staff school offerings designed to ensure the continued enrollment and school success of dropout-prone students enrolled in the lower grades and the re-enrollment of two million school dropouts under age 19.
- New teachers to provide individualized instruction and allow experimentation with instructional approaches that could help students who have difficulty mastering basic learnings and skills in traditional classrooms.
- New teachers to allow increased use of released time for teachers to renew and share their skills and to develop improved instructional resources.

—Chart I compares actual demand with quality demand.

Part 3: TEACHER SUPPLY COMPARED TO DEMAND

- The 1981 supply of 206,750 qualified teacher-applicants was more than adequate for the 109,550 jobs to be filled. The 108,900 applicants from the 1981 graduating class exceeded the number of jobs open to them (76,550) by 32,400. **SD1**

- Mathematics and special education continue to have shortages of qualified applicants (see Chart J). Low supply compared to demand is also observed in natural and physical sciences, industrial arts, vocational-technical assignments, and agriculture. Lack of attractiveness of teaching jobs, instead of inadequate numbers prepared to teach, seems to be the major reason for shortages in most of these areas. **SD2**

- The 47,250 new graduates seeking to enter elementary school assignments far outnumber the 33,050 jobs open to them (see Chart J). This continuing annual surplus may decrease beginning in 1985, when the number of teaching jobs in the primary grades will increase for several years. **SD3**

- The severity of the annual surpluses of prospective begining teachers decreased during the late 1970's (see Chart K). Slightly more than half (52.1 percent) of the 1980 teacher-education graduates obtained teaching jobs, up from less than half between 1973 and 1977. However, this is still far below the more than two-thirds obtaining employment in teaching during the 1960's.

- The supply of 206,750 qualified teacher-applicants in fall 1981 was not large enough to fill the minimum of 536,400 positions that would have to be filled to immediately raise the quality of school programs and services to minimum levels. **SD**

CHART J – SUPPLY COMPARED TO DEMAND FOR BEGINNING TEACHERS, FALL 1981, BY TEACHING ASSIGNMENT

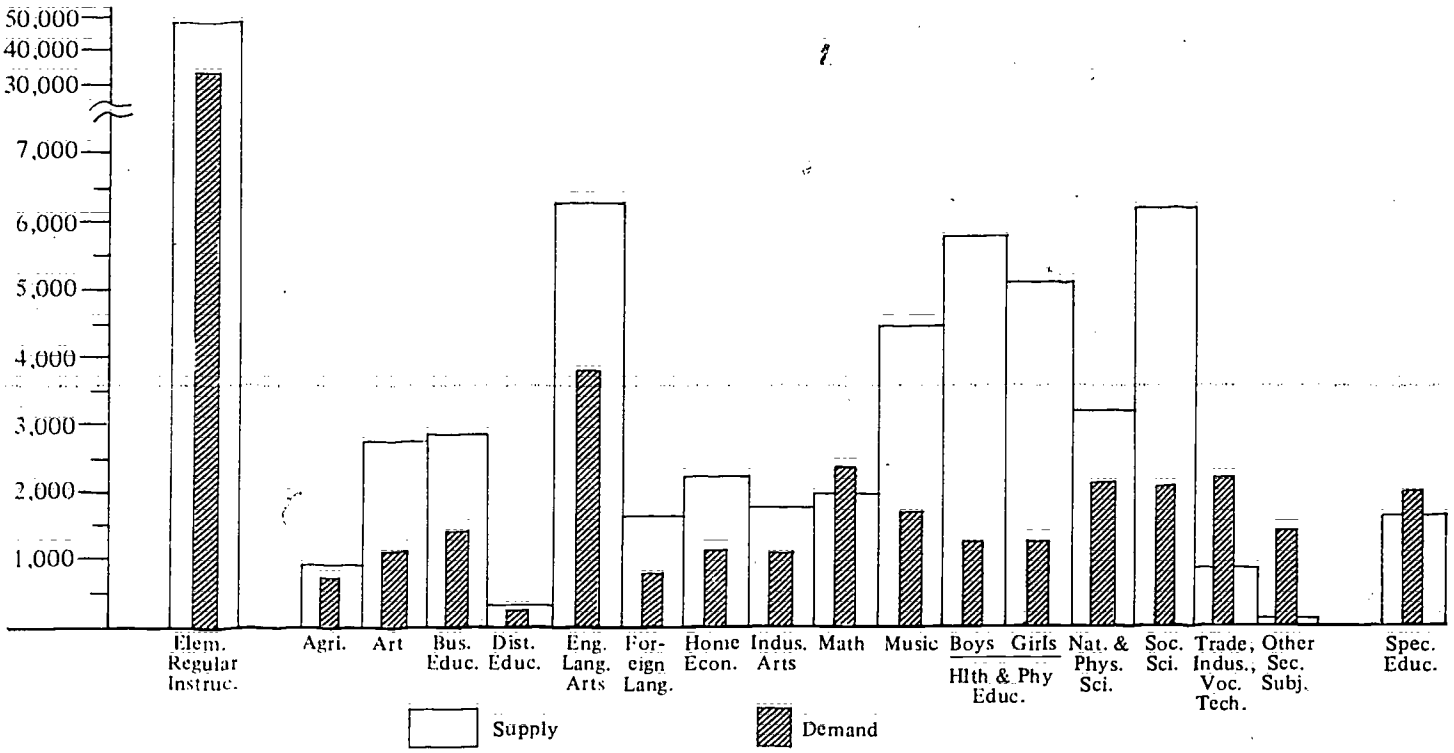
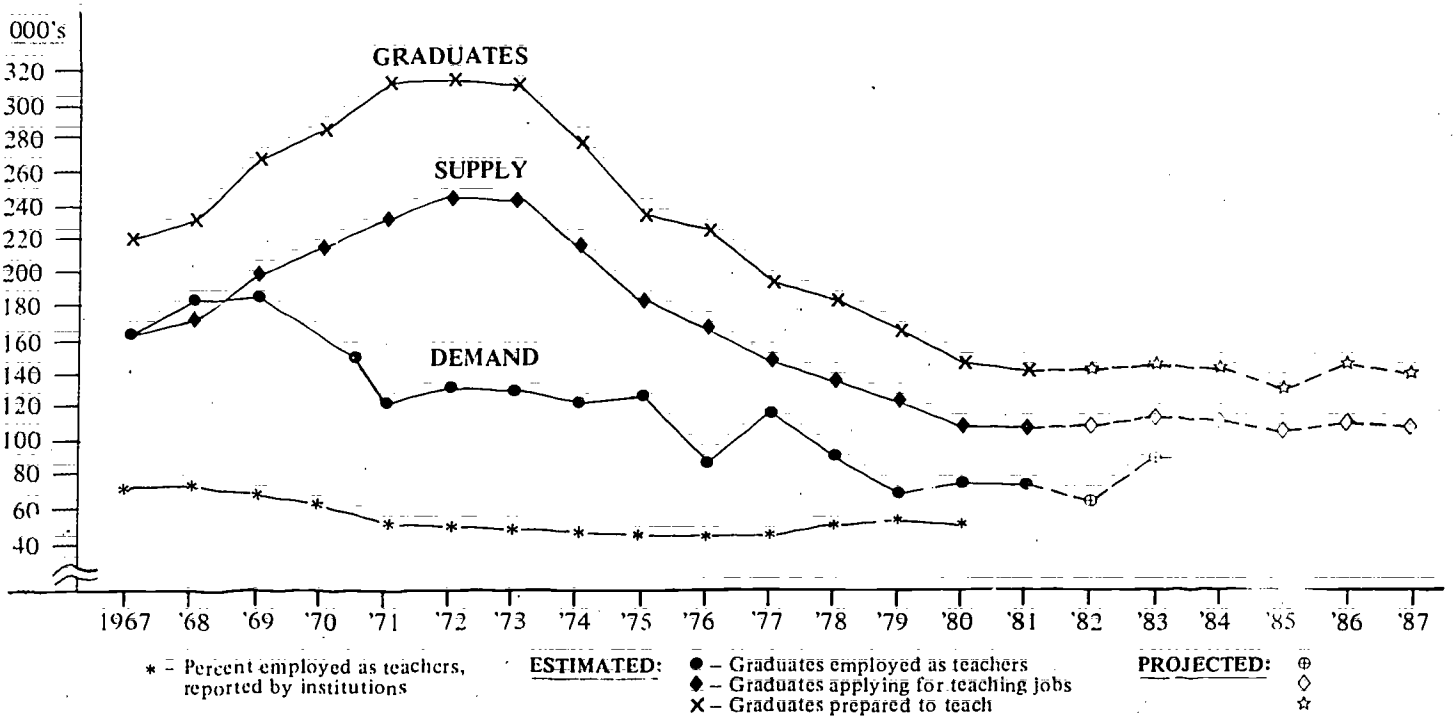


CHART K – SUPPLY AND DEMAND FOR BEGINNING TEACHERS AND PERCENT OF TEACHER EDUCATION GRADUATES EMPLOYED AS TEACHERS, FALL 1967 TO FALL 1981 AND PROJECTED TO FALL 1987.



- OUTLOOK FOR TEACHER SUPPLY AND DEMAND IN THE 1980's

  —If teaching employment becomes less attractive:

  - Shortages will intensify in the assignments presently least well supplied.
  - Additional assignment areas will face shortages of qualified applicants. **SD5**

  —If teaching salaries and working conditions remain near present levels:

  - Shortages will continue in the assignments presently least well supplied.
  - Numbers preparing for the enlarged numbers of elementary school and special-education assignments probably will be adequate as a result of improved employment outlook. **SD6**

  —If teaching salaries and working conditions are improved:

  - Shortages in most assignment areas will be reduced immediately as a result of the application for teaching employment by larger numbers of graduates prepared for these fields.
  - Increased numbers will prepare for assignment areas needing additional applicants, and this will gradually eliminate most shortages.
  - Larger numbers of the most able graduates prepared to teach will seek teaching employment, and this will gradually improve the quality of schools. **SD7**

SECTION II — DETAILED INFORMATION AND TABLES

Part 1: SUPPLY

S1. Conditions Influencing the Supply of Teachers: The importance of salaries in a person's decision to prepare for and seek employment in teaching is probably obvious. As the levels of beginning and career salaries increase, larger proportions of students are attracted to this career. If salaries approach those paid in other professions, more students capable of many career options will seriously consider teaching. As the numbers seeking to enter teacher preparation and employment increase, both the preparation institution and the employer will have a wider range of candidates from which to select those students and graduates most likely to be effective teachers. This increased selectivity will lead to improved quality, among both those being employed and those being encouraged to remain in their jobs.

The National Education Association recognizes the importance of teacher salaries in the attainment and maintenance of teaching as a profession. The Association calls for the use of a professional salary schedule that, among other features, should:

- Provide scheduled minimum salaries which are competitive with beginning salaries paid to college graduates entering business and industry and adjusted annually through negotiated contracts which result in a doubling of the current annual minimum salary within 10 years of faculty experience.
- Compare favorably with income in other professions and occupations of comparable preparation and responsibility.

(Excerpts from Resolution E-7, Salary Goals, passed by NEA's 1982 Annual Meeting.)

> The following observations evaluate the role of salaries in the supply of teachers.
>
> (This book) shows that salaries do make a difference. The supply response to a change in wages is, as one might expect, larger for men graduates than for women. Not only starting salaries, but the whole salary profile, affect the numbers entering teaching. The salaries paid at older ages have a relatively greater effect on the number who leave the profession than they do on the numbers who enter.
> (M. Blaug and R. Layard, "INTRODUCTION" to Antoni Zabalza, Philip Turnbull, Gareth Williams, and Mary Jean Bowman, *The Economics of Teacher Supply*, Cambridge University Press, 1979, pp. viii-ix.)

The importance of salaries and working conditions in attracting and holding effective teachers is supported by a study of unusually effective schools. This analysis revealed factors common to schools and school districts that consistently produced outstanding students, even after socioeconomic considerations were accounted for. The researchers found, for example, that "outstanding Michigan schools had smaller classes, better-paid teachers, and more teachers with greater than five years experience." (Robert E. Klitgaard and George R. Hall, "Are There Unusually Effective Schools?" Journal of Human Resources, X, 1, pp. 90-106.)

S2. Stock of teachers: The estimated total population prepared to teach is based on the cumulative numbers annually completing preparation to enter teaching with at least a bachelor's degree, as reported in surveys by NEA Research. Estimates for years prior to 1950 (the year when reasonably complete national estimates became available) are based on an assumption that twice as many completed preparation to teach in those earlier years as were actually teaching in 1960-61 and reported beginning their teaching careers prior to 1950.

For example, the Washington State Board of Education reported that in the school years 1965-66 and 1972-73, the percent of teachers starting their careers in that state 15 years earlier ranged between 44.7 and 53.7 percent. These may be conservative estimates of the proportions remaining in teaching because those moving to out-of-state positions were not counted. (*Teacher Supply and Demand in Washington State*, Annual Reports.)

Table 1 shows the numbers of teachers certifiable nationwide in 1939-40 through 1980-81, the numbers currently living, the numbers still teaching, the proportions of 1980-81 teachers according to date of initial entry into teaching, and the estimated percents of persons completing preparation in each time period who were teaching in 1980-81. Estimates of numbers in each age bracket were adjusted using mortality rates applicable to all college graduates in the population.

TABLE 1.—ESTIMATE OF THE STOCK OF PERSONS PREPARED TO TEACH AND THEIR EMPLOYMENT STATUS AS TEACHERS IN 1980-81.

Year of initial certification	Graduates meeting minimum certification requirements			Public School Teachers in 1980-81 by date of initial entry		Percent of stock employed as public school teachers in 1980-81
	Number	Estimated average annual mortality rate[a]	Number living in 1981-82	Percent	Number	
1	2	3	4	5	6	7
1939-1940	200,925	4.7	160,740	0.3[c]	6,626	4.1
1941-1945	227,600	4.0	190,501	2.0[c]	43,320	22.7
1946-1950	328,150	2.5	288,124	5.5[c]	119,938	41.6
1951-1955	470,609	2.5	441,431	7.2	156,816	35.5
1956-1960	570,712	2.0	550,281	10.0	217,800	39.6
1961-1965	789,716	1.4	1,179,801	20.2	439,956	37.3
1966-1970	1,199,960	1.1	770,921	13.7	298,386	38.7
1971-1975	1,461,310	1.1	1,445,236	24.2	527,076	36.5
1976-1979	760,876	1.0	756,311	14.5	315,810	41.8
1980-1981	284,574	1.0	278,883	2.4	52,272	18.7[b]
	6,294,432	2.3	6,062,229	100.0	2,178,000	35.9

[a] Rate per 1,000
[b] 1981 graduates had not completed requirements in Fall 1980.
[c] Estimate

The estimated distribution of members of this total pool by their teaching and employment status is shown in Chart A and in Table 2.

The estimate of 2,178,000 teachers employed in public schools in 1980-81 is based upon data reported by NCES, summarized in the section on teacher demand.

TABLE 2.—STOCK OR NUMBER OF PERSONS, AGED 21 TO 65 IN 1981, WHO HAVE COMPLETED CERTIFICATION REQUIREMENTS FOR PUBLIC SCHOOL TEACHING.

Labor force, employment, teaching status in Fall 1981	Estimated number of persons
1	2
Employed as public school teachers, 1980-81	2,200,000
Graduates completing preparation to enter teaching for first time in fall 1981	140,000
Former teachers	
In other employment	1,350,000
In the labor reserve	530,000
Never employed as teachers in public schools	
In other employment	1,530,000
Did not apply for teaching jobs (920,000)	
Applied for but not employed in teaching jobs (610,000)	
In the labor reserve	350,000
Did not apply for teaching jobs (310,000)	
Applied for but not employed in teaching jobs (40,000)	
Total persons in the population prepared to teach	6,100,000

S3. New graduates prepared to teach: The number of graduates who for the first time completed the requirements for certification to enter public school teaching fluctuated near 100,000 each year from 1950 through 1958, as shown in Table 3. Throughout the remaining 1950's and 1960's, the numbers increased each year, as did the total number of those attaining a bachelor's or first professional degree. Graduates prepared to teach reached a peak total of 317,254 in spring 1972. The total annual number of bachelor's and first-professional-degree graduates increased for two additional years and then stabilized during the remaining 1970's.

The numbers prepared to enter teaching have declined each year since 1972, with 140,639 estimated for the spring of 1981. That figure approximately equals the number for 1962, when there were 142,343 new graduates prepared to teach.

The graduates prepared to teach represented at least 30 percent of all bachelor's and first-professional-degree recipients each year from 1954-55 through 1972-73 and for 11 years during this period exceeded one-third of these total graduates.

The proportion of graduates with bachelor's and first professional degrees prepared for initial entry into teaching was at probably an all-time low in 1981, at 14.0 percent. A major reason for the continuing drop since 1972 in the percents of graduates prepared to enter teaching is almost surely the shift from an era of annual teacher shortages to the current one of surpluses that began in the early 1970's. The swing from shortage to surplus is shown in Table 4.

The numbers prepared to enter special-education assignments reached a peak in 1974 and have not decreased as markedly as those prepared for regular elementary or secondary classroom instruction (see Table 5). This difference probably reflects the higher chances for teaching employment for persons certified in special education.

TABLE 3.—GRADUATES PREPARED TO TEACH AND TOTAL BACHELOR'S AND FIRST PROFESSIONAL DEGREES, 1949-50 THROUGH 1980-81.

Year	Total graduates prepared to teach[a]	Total bachelor's and first professional degrees	Teacher education graduates as percent of BA and first-professional-degree graduates
1	2	3	4
1949-50	115,477	433,734	26.6%
1950-51	106,797		
1951-52	99,159	331,924	29.9
1952-53	91,443		
1953-54	85,801	292,880	29.3
1954-55	87,409	285,841	30.6
1955-56	97,586	309,514	31.5
1956-57	109,091	338,436	32.2
1957-58	114,411	363,502	31.5
1958-59	119,421	382,904	31.2
1959-60	130,203	392,440	33.2
1960-61	129,188	392,710	32.9
1961-62	142,343	417,846	34.1
1962-63	153,843	447,622	34.4
1963-64	174,133	498,654	34.9
1964-65	190,209	530,003	35.9
1965-66	198,599	551,047	36.0
1966-67	219,587	590,547	37.2
1967-68	233,281	666,710	35.6
1968-69	264,217	764,185	34.6
1969-70	284,276	827,234	34.4
1970-71	313,558	877,676	35.7
1971-72	317,254	930,684	34.1
1972-73	313,141	972,380	32.2
1973-74	279,145	999,592	27.9
1974-75	238,212	978,849	24.3
1975-76	222,049	988,395	22.5
1976-77	194,036	982,908	19.7
1977-78	181,348	987,785	18.4
1978-79	163,443	990,238	16.5
1979-80	143,935	999,601	14.4
1980-81	140,639	1,003,700	14.0

SOURCES: NEA Research Studies of Teacher Supply and Demand NCES Reports on Earned Degrees and Projections of Education Statistics.

[a] Graduates prepared for library science assignments are included for years prior to 1965-66.

TABLE 4.—TRENDS IN TEACHER SUPPLY AND DEMAND, 1967-68 THROUGH 1991-92.

Session	Previous year's graduates prepared to enter teaching (in thousands)		Estimated numbers of new graduates (in thousands)		Supply as percent of demand	Percent of previous year's teacher education graduates on November 1				
	Actual and projected	Estimated from 1967 proportion	Applying for teaching jobs[a]	Receiving teaching jobs[b]		Employed as teachers	Seeking a teaching job	Otherwise gainfully employed	Status unknown	With follow-up information reported
1	2	3	4	5	6	7	8	9	10	11
1967-68	220	220	164	164	100.0	70.0	0.9	4.2	15.5	83.8
1968-69	233	248	175	183	95.6	70.5	1.6	3.8	14.8	79.2
1969-70	264	284	199	184	108.2	67.3	2.5	4.3	16.8	81.0
1970-71	284	308	213	152	140.1	60.1	4.5	5.8	18.8	88.0
1971-72	314	326	236	121	195.0	53.3	7.6	6.4	22.5	82.0
1972-73	317	346	244	131	186.3	50.9	10.1	9.7	20.6	81.2
1973-74	313	362	241	128	188.3	49.8	9.4	9.5	23.1	77.3
1974-75	279	372	215	121	177.1	47.8	9.1	10.3	24.0	84.7
1975-76	238	364	183	126	145.2	45.7	10.6	10.1	25.3	86.4
1976-77	222	368	171	87	196.6	47.4	11.7	11.0	21.4	67.3
1977-78	194	366	149	119	125.2	49.4	9.1	11.8	21.1	69.3
1978-79	181	367	139	94	147.9	50.1	7.6	11.6	22.7	72.7
1979-80	163	368	126	72	175.0	54.2	5.9	11.5	20.4	72.0
1980-81	144	372	111	78	142.3	52.1	NA	13.4	20.8	68.4
1981-83	141	373	109	77[c]	142.3	. . .	. . .	. . .	. . .	. . .
PROJECTED										
1982-83	143	379	109	64[c]	171.9					
1983-84	145	386	112	92	121.7					
1984-85	145	386	112	90	124.4					
1985-86	145	386	112	122	91.8					
1986-87	148	393	114	129	88.4					
1987-88	146	389	112	133	84.2					
1988-89	143	381	110	134	82.1					
1989-90	142	377	109	139	78.4					
1990-91	141	374	109	155	70.3					
1991-92	139	371	107							

[a] Application rate of 75 percent prior to 1972-73, 77 percent for 1972-73 and subsequent years.
[b] NCES data on change in total teachers plus turnover-created openings for beginning teachers at rate of 5.5 percent prior to 1972-73 and 4.3 percent for 1972-73 and subsequent years.
[c] Net turnover rate of 4.7 percent is used for sessions 1981-82 and 1982-83.
NA—Not available.

TABLE 5.—NUMBER OF COLLEGE GRADUATES COMPLETING MINIMUM CERTIFICATION REQUIREMENTS FOR INITIAL ENTRY INTO PUBLIC SCHOOL TEACHING, BY LEVEL, FOR 1950-51, 1955-56, 1960-61, 1965-66, AND 1970-71 THROUGH 1980-81

Year of graduation	Teaching level for which prepared			
	Elementary	Secondary	Special education	Total
1950-51	33,782	72,587	. . .	106,369
1955-56	40,801	56,506	. . .	97,307
1960-61	51,866	76,950	. . .	128,816
1965-66	79,669	114,550	4,380	198,599
1970-71	126,863	174,759	11,936	313,558
1971-72	128,613	171,814	16,827	317,254
1972-73	126,684	164,850	21,607	313,141
1973-74	109,586	141,593	27,966	279,145
1974-75	90,974	120,186	27,052	238,212
1975-76	84,718	110,226	27,105	222,049
1976-77	74,154	95,371	24,511	194,036
1977-78	69,441	88,537	23,370	181,348
1978-79	63,099	78,216	22,128	163,443
1979-80	57,003	66,935	19,997	143,935
1980-81*	55,904	64,389	20,346	140,639

*Estimate

NOTES: Data were not collected for special education prior to 1965-66. Numbers by teaching levels are not accurate because many graduates prepare to teach at more than one level, and institutions differ in the extent that special education is reported as a separate category. The numbers listed are the corrected estimates of the numbers graduating. The numbers for 1975-76 and 1976-77 have been revised from original reports to correct for the double reporting in one state of persons prepared for more than one assignment level. The 1980-81 numbers are a compilation of the numbers institutions expected to graduate in 1980-81.

The numbers prepared for teaching jobs in these three major categories (elementary, secondary, and special education) are not precise. Many graduates prepare for subject fields that may be taught on a departmentalized basis in grades K through 12. Institutions were asked to report graduates having these K-12 assignment potentials in the category in which they were most likely to apply for teaching jobs. Also, some states do not collect data for special-education teachers as a separate category.

Each year NEA Research requests all teacher-preparation institutions to report the number of persons completing for the first time the certification requirements for public school teaching with at least a bachelor's degree. The institutions are asked to report their estimates of the numbers to be graduated in the year of the survey, along with the actual numbers graduated the preceding year. In the early years of these studies, institutions also reported the number of persons meeting minimum certification requirements that did not receive the bachelor's degree. Data reported in this Memo include only the number of graduates prepared to enter teaching who received a bachelor's or higher degree.

NEA Research has not always been successful in its attempts to obtain responses from all of the institutions that prepare graduates for initial certification to teach. As a result, the data are likely to be conservative estimates of the numbers of new graduates prepared to teach.

Estimates for 1981 were not received from 67 institutions that had participated in the survey in 1980. Information included for these institutions is based on the assumption that there was no change in the numbers prepared to teach by these institutions between 1980 and 1981. The production of these 67 institutions is about 3.9 percent of the total number completing preparation to teach.

S4. Future numbers prepared to teach: The summaries in Table 4 and in Chart K show that each year during the 1970's, the supply of prospective beginning teachers exceeded the number of positions open to them. The numbers completing preparation to enter teaching decreased each year after 1972, probably as a consequence of this oversupply of applicants for teaching jobs.

These decreases in the numbers prepared to enter teaching during the 1970's have averted the development of a *massive* surplus of graduates seeking teaching jobs. The demonstrated responsiveness of college students to the changes in supply-demand conditions suggests that there is little reason to expect severe shortages or surpluses as long as teaching jobs are fairly attractive.

A sample of college freshman is surveyed each year for a study of their characteristics, status, and plans. This study, *The American Freshman: National Norms for Fall 1981*, is conducted by the Cooperative Institutional Research Program at the University of California, Los Angeles, with support from the American Council on Education. The percents of these students over the past 16 years who have reported that they will probably enter elementary or secondary teaching are reported in Table 6. The summary shows that the proportions of college freshmen planning to teach in elementary or secondary schools decreased significantly between 1969 to 1973. This accompanied the change from annual national estimates of teacher shortages in the 1969's to surpluses in the 1970's. The rate of decline of the percents planning to teach eased between 1973 and 1980, but a record low may have been reached in 1982.

TABLE 6.—FIRST-YEAR ENROLLMENT, PERCENT OF FRESHMEN PLANNING TO TEACH, AND PROJECTED GRADUATES PREPARED TO TEACH, 1966 THROUGH 1982.

Year (Fall)	First-Year enrollment in higher education	Percent of freshmen: Planning to teach in elementary or secondary schools	Percent of freshmen: Undecided about career objective	Year of normal graduation (Spring)	Projected number prepared to enter teaching[a]
1	2	3	4	5	6
1966	1,565,564	21.7%	4.3%	1970	339,727
1967	1,652,317	22.4	10.1	1971	370,119
1968	1,907,938	23.5	11.1	1972	448,365
1969	1,983,992	22.1	11.3	1973	438,462
1970	2,080,244	19.3	11.6	1974	401,487
1971	2,135,947	15.4	13.2	1975	328,936
1972	2,171,268	12.1	13.9	1976	262,723
1973	2,248,100	8.8	11.2	1977	197,833
1974	2,392,869	7.7	12.4	1978	184,251
1975	2,543,552	6.5	13.7	1979	165,331
1976	2,377,242	8.0	10.3	1980	190,179
1977	2,431,600	6.9	9.7	1981	167,780
1978	2,422,398	6.2	10.6	1982	150,189
1979	2,538,119	6.4	10.4	1983	162,440
1980	2,625,138	6.0	10.1	1984	157,508
1981	2,595,421	5.5	10.1	1985	142,748
1982	2,550,000[b]	4.7	9.5	1986	119,850

SOURCES: NCES—Fall enrollment in Higher Education Series and unpublished estimates
ACE—The American Freshman: National Norms Series

[a] Projection assumes all first-year students will graduate and will not have changed their occupational objective.

[b] Unpublished estimate.

The information in Table 6, Column 4, shows that about one in 10 additional freshmen reports being undecided about a career objective. This suggests that projections based on early intent cannot be very precise. About one in ten of these students also indicates that the chances are very good that he or she will change the initial career choice, further reducing the precision of projections based upon first-year intent.

Also summarized in Table 6 are the numbers of first-year students in higher education, along with projections of the graduates prepared to enter teaching four years later, assuming that the freshmen in the survey are representative of first-year students and none of the first-year students will drop out or change their career objectives. This procedure at least provides an indication of trends in the numbers of graduates prepared to teach three years hence. Because the number of those entering higher education grew throughout the 1970's to an all-time high in 1980, the projected numbers of graduates prepared to teach did not decrease to the extent suggested by the drop in the percents indicating a teaching career objective.

The future numbers of teacher-education graduates *projected* from freshmen intent show a continuing decrease in the class of 1982, followed by little change in 1983 and 1984 and then a further decrease in 1985 and 1986.

A special survey by NEA Research in the early 1970's of the nation's institutions that prepare the largest numbers of teachers found that most institutions are not able to supply estimates of the numbers preparing to teach prior to student enrollments in the junior year. This suggests that college students have considerable flexiblity in establishing their degree objective during the first two years of college. The presence of this flexibility also is supported by the information in Table 7. As a percent of the number of teacher-preparation graduates projected from first-year intent, those who actually completed preparation to teach (Column 4) decreased significantly in 1972 through 1975. This reduction accompanied, to some extent, the change in teacher supply-demand conditions during the sophomore year of these graduates as reported by NEA Research and as observed by these students.

TABLE 7.—PROJECTED AND ACTUAL NUMBERS OF GRADUATES PREPARED TO TEACH, 1970 THROUGH 1981.

Spring	Teacher education graduates, projected from Freshman intent four years earlier	Estimated numbers prepared to teach, as reported by NEA Research	Estimated numbers of teacher-education graduates as percent of projected number	Year these graduates were Sophomores	Market conditions in Spring of Sophomore year, measured by supply as percent of demand
1	2	3	4	5	6
1970	339,727	284,276	83.7%	1968	95.6%
1971	370,119	313,558	84.7	1969	108.2
1972	419,746	317,254	75.6	1970	140.1
1973	438,462	313,141	71.4	1971	195.0
1974	401,487	279,145	69.5	1972	186.3
1975	328,936	238,212	72.4	1973	189.1
1976	262,723	222,049	84.5	1974	177.1
1977	197,833	194,036	98.1	1975	146.0
1978	184,251	181,348	98.4	1976	196.6
1979	165,331	163,443	98.9	1977	125.2
1980	190,179	143,935	75.7	1978	147.9
1981	167,780	140,639	83.8	1979	175.0

Just as first-year students intending to become teachers changed their career objectives prior to graduation in response to the change in the market for teachers, it is likely that more students will elect to prepare for teaching careers if the job market improves.

The three projections of future numbers of teacher-education graduates shown in Chart B reflect the following assumptions:

- Lowest projection—the number of graduates completing preparation to enter teaching will represent 14.0 percent of all recipients of bachelor's and first professional degrees. This is the proportion estimated for 1981.
- Middle projection—the number of graduates completing preparation to enter teaching will be the same as the number of entering students four years earlier who indicated they planned a career objective in teaching.
- High projection—the number of graduates prepared to enter teaching will represent 22.5 percent of all recipients of bachelor's and first professional degrees, the same level that was observed in 1976.

An additional projection, shown in Table 4, Column 3, is based on an assumption that graduates prepared to teach will represent 37.2 percent of all those receiving bachelor's and first professional degrees, the level observed in 1967.

S5. Applicants for teaching positions: Typically, many persons completing preparation to enter public school teaching jobs do not apply for teaching positions. The unmeasured and interrelated effects of many factors make it impossible to estimate the exact number who will actively seek teaching employment immediately following graduation. The percent of qualified graduates obtaining teaching positions during a period of general shortages of qualified teachers provides a useful base for estimating the percent of present graduates expected to seek teaching positions if working conditions and salaries are reasonably attractive. This estimate is likely to be conservative because even during the period of general shortages, the supply of applicants exceeded the number of openings in some assignment areas (notably in social studies, which is the field of a significant number of graduates prepared to teach). Also, follow-up information was not available for 10 percent of the graduates, some of whom may have found teaching positions without notifying their college placement office. Also, depending on the current effects of the above factors, projections from this base may be higher or lower than the actual percents of qualified graduates actively seeking teaching positions.

The estimated application rate used as the basis for computing the figures in Table 11, 12, and 13 is 77 percent of graduates prepared to teach. This is the level observed in the National Center for Education Statistics studies of 1975-76 and 1976-77 graduates prepared to teach. It is also the average of two different levels projected for persons prepared for elementary or secondary assignments.

The application rate for teaching jobs for graduates prepared to teach at the elementary school level is estimated at 84.5 percent. In 1958, when entry rates were near their peak and follow-up information was reported for a very high proportion of teacher-education graduates, 83.3 percent of those prepared for elementary school assignments entered teaching positions immediately after graduation, and an additional 1.7 percent were seeking teaching jobs.

The application rate for graduates prepared to teach in secondary schools is estimated at 71.5 percent. In 1962, immediate employment in teaching positions was reported for 69.2 percent of graduates prepared to teach in secondary school assignments, and an addtional 1.5 percent were seeking teaching jobs.

The job-application rate estimated for graduates prepared to teach in special-education assignments is the overall average (77.0 percent) of the rates estimated for elementary and secondary levels.

The job application rates estimated for 1981 may be higher than the actual rate (particularly in such assignment areas as industrial arts, agriculture, mathematics, and the sciences) as a result of graduates' awareness of the recent deterioration in teachers' salaries, plus the evidence of some improvement in the job market for college graduates in some other

occupations. On the other hand, the estimated rates may be conservative as an outcome of continuing reaction to the annual teacher surplus, such as the increased screening of students who are preparing to teach, increased student awareness of the tight job market for teachers, and greater commitment to teaching as a career among present graduates.

Survey reports and new releases about unusually severe shortages of teachers in mathematics, agriculture, sciences, industrial arts, and other vocational-technical areas point to low salaries in teaching (compared to other employment available to teacher-education graduates) as a primary factor in reducing both the supply and the quality of graduates applying for teaching jobs in these assignments. In two states, more than 25 percent of the graduates prepared to teach industrial arts entered jobs outside of teaching. Another survey reports that only 52.2 percent of the 1981 graduates prepared to teach vocational agriculture entered teaching in this assignment and that this is lower than the entry rates reported for all but three (1980, 1971, and 1970) of the past 16 years (David G. Craig, *A National Study of the Supply and Demand for Teachers of Vocational Agriculture in 1981*. Knoxville, University of Tennessee). Also, this survey reports that in 16 states, less than 40 percent of the qualified 1981 graduates entered vocational-agriculture teaching assignments. The average salary offered in June 1981 by private industry to bachelor's degree graduates in mathematics ($18,600) is higher than the average 1981-82 salary paid to *all* teachers in each of 27 states. In 1975, this average salary offer was higher than the average salary paid to teachers in each of 20 states.

The number of former teachers estimated to have reentered teaching in 1960-61 represented 18.3 percent of the 1960 pool of elementary-secondary school teachers in the labor reserve. Applying this percentage to the 534,600 persons estimated in this pool in 1981, at least 97,800 experienced former teachers having a minimum of a bachelor's degree may be assumed to have been seeking employment in public schools in fall 1981 if attractive positions were available. Probably two-thirds (65,200) of these applicants were experienced at the elementary school level.

S6. Competitiveness of beginning teacher salaries: Lack of attractiveness of teaching salaries is shown by comparing average beginning salaries offered to bachelor's degree recipients entering teaching in 1980-81 ($11,758) to those offered by private-industry. Salary estimates are published in the annual "Endicott" reports of salary offers by a sample of about 200 companies to bachelor's degree graduates in 10 subject groupings. The Endicott reports are published by Northwestern University, Evanston, Ill.

An NCES study, *1976 Survey of 1974-75 College Graduates*, reports that the average annual salary of bachelor's degree graduates entering teaching jobs ($8,300) was lower than that received by graduates entering full-time employment in each of 16 other occupation groupings, except for clerical and kindred occupations for which the average salary was $7,900. The average salary paid to all full-time employed bachelor's degree graduates in this study was $9,400.

This NCES study also reported that the average salary received by full-time employed bachelor's degree graduates majoring in education ($8,100) was lower than that received by graduates majoring in all but two of the remaining 10 major field categories: humanities ($8,000) and biological sciences ($7,900).

S7. Trend in level of beginning teacher salaries: Recent deterioration in attractiveness of salaries for beginning teachers is evident from a comparison in Chart D of the percentage change between 1975 and 1981 in beginning teacher's salaries (up 45.6 percent) versus salary offers by private industry to new bachelor's degree graduates (up 59.3 to 69.0 percent). The table containing the data from which these statistics are derived is published by NEA Research (*Prices, Budgets, Salaries, and Income, Spring Issue*, February 1983).

Part 2: DEMAND

D1. Change in the number of teaching jobs: The total number of teaching jobs depends on the number of K-12 students enrolled and the ratio of students to teachers. Even though enrollments do not change significantly, the number of teaching positions may increase to reflect a continuing reduction in the number of students per teacher. The annual reductions in this ratio resulted from the increased emphasis on providing more small classes for students requiring greater instructional attention, departmentalizing some elementary school subjects in order to release teachers for planning-preparation periods, providing increased numbers of vocational-technical courses for high school students, and reducing the number of severely large classes. Future annual rates of reduction in the student-teacher ratio may be smaller than those for recent years as an outcome of financial constraints on larger numbers of school systems as well as the decreased growth rate of secondary school enrollments (where the ratio is lower than for elementary school grades.) NCES projections of the number of public school teachers include an assumption that these student-teacher ratios will continue their long-term annual declines.

Accurate figures on the change in the total number of teachers employed between 1980-81 and 1981-82 are not yet available. Information from three sources is used to derive an estimate for this study: projections by NCES, estimates by NCES, and the compilation of state department of education estimates by NEA Research. (The difference between projections and estimates is that projections are made earlier. Estimates then take into account intervening developments. However, actual figures may not be available until several years later.)

The number of teaching positions declined significantly between 1980-81 and 1981-82. The extent of this decline is not yet fully reported. The projections by NCES pointed to a decrease of 44,000 positions from the 2,163,000 public school teachers employed in 1980-81. Also, these projections show another decrease of 19,000 positions between 1981-82 and 1982-83. On the other hand, estimates issued by NCES in September 1982 show the 2,183,500 teachers in public schools in 1980-81 decreasing by only 13,500 in 1981-82.

State education department estimates of the number of teachers compiled by NEA Research in 1982 show the number of public-school teachers decreasing from 2,200,107 in 1980-81 by 14,091 in 1981-82. Several states apparently did not accurately estimate the effects of population declines and financial constraints. The revised estimates from the states published in the 1982-83 edition of NEA Research (*Estimates of School Statistics*) show the number of public school teachers dropping from 2,202,841 in 1980-81 by 45,000 teaching positions to 2,157,827 in 1981-82. Their estimates of the number of teachers in 1982-83 show an additional decrease of 19,255 positions.

For the purposes of this Memo, it is estimated that the number of teaching positions decreased by 27,000 between 1980-81 and 1981-82. This is near the midpoint of the most recent estimates from NCES and from the the state departments of education.

This figure is a very general estimate, the actual number may be within a range of plus or minus 10,000 positions. Because the number of teaching positions decreased, the demand for new teachers to fill new positions is subtracted from (instead of added to) the number of teaching positions vacated by teacher turnover to estimate the total demand for new teachers. Therefore, this figure may lead to an overestimate of the jobs for new teachers as the states reported to NEA Research a larger net loss in the number of teaching positions. On the other hand, it may lead to an underestimate of the number of jobs for new teachers because not all of the 5,800 added teaching jobs in 14 states may be filled by teachers formerly employed in the 50,800 positions being discontinued in the other 35 states and D.C. (one state had no change in the number of teachers). Also, even within a state it may not be accurate to assume that positions being created in some school systems will be filled entirely by teachers transferring from school systems losing teaching jobs.

D2. Positions opened by teacher turnover: Decreased rates during the 1970's of voluntary departures from active employment as teachers seem to have occurred as a result of an increased teacher awareness of the difficulties of securing employment following an interruption in service. Also, many who would have liked to continue to teach following a move to a

new location were not able to secure employment readily. Beyond this, many teachers who left teaching (by choice or involuntarily) in regions that were losing enrollments were not able to move to jobs available in other regions even if they were being recruited for such positions.

An estimate that 136,500 teachers (6.2 percent) left teaching positions for at least one year at the end of 1980-81 is used for this report. This is somewhat higher than the 5.9 percent used in recent studies of this series. The absence of employment opportunities for teachers losing their positions as a result of enrollment declines and financial constraints on schools is the primary cause for this change. Experienced teachers must compete with less expensive, inexperienced teachers for the relatively few positions that are to be filled. Most school systems face continuing financial constraints that place experienced teacher-applicants at an increasing disadvantage in competing for jobs because their previous experience and preparation would command a higher salary than that paid to beginning teachers.

Statistics from the periodic study of the American public school teacher by NEA Research show that the proportion of all teachers who were teaching in a different school system the previous year has decreased from 6.9 percent in 1965-66 to 2.2 percent in 1980-81. Those teaching in the same school system the preceding year increased from 80.5 percent of all teachers in 1965-66 to 92.5 percent in 1980-81.

Loss of opportunities to move into more attractive teaching locations during the 1970's probably has been a major cause of the increased numbers of teachers expressing low morale. Many teachers probably feel frustrated by the loss of the option to move into school systems that pay higher salaries and have more attractive working conditions.

This Memo's estimate that 6.2 percent of teachers left teaching at the end of 1980-81 is lower than the departure levels observed in national surveys in the late 1950's and 1960's. The NCES reported a loss of 10.9 percent between fall 1957 and fall 1958 (7.9 percent between spring 1958 and fall 1958) and a loss of 8.1 percent between fall 1959 and fall 1960. NEA Research reported a loss of between 5.8 and 9.1 percent between 1965-66 and 1966-67 (3.3 percent had left teaching positions but their subsequent status was not known), and NCES estimated that between 6.5 and 9.1 percent left the profession between fall 1968 and fall 1969 (the subsequent teaching status of 2.6 percent was not known).

This 6.2 percent rate of loss at the end of 1980-81—somewhat higher than that used in earlier reports of this series but much lower than that that estimated in the 1960's—reflects the continuing effects of a tight job market for college graduates and the resulting abundant supply of applicants for attractive teaching jobs. More recent national estimates of teachers leaving the profession are not available from NCES, but state departments of education in Delaware, Illinois, and Michigan report reductions in teacher-loss rates during the 1970's (ranging between 10 and 12 percent in 1973-74 and between 7.5 and 9 5 percent in 1977-78). A study of job survival rates of beginning teachers in the St. Louis metropolitan area shows a smaller proportion leaving teaching each year between 1968 and 1976 (Mark and Anderson, *American Educational Research Journal*, Summer 1978). Also, in the annual NEA Research survey of a sample of public school teachers, the percent of teachers who are beginning teachers has not increased.

D3. Total actual demand for new teachers: The combined effects of enrollment declines, teacher-student ratio changes, and teacher departures from the profession provided the basis for the estimate that 109,550 positions needed to be filled by new teachers in fall 1981.

Looking forward to fall 1982, application of the same rate of teacher loss (6.2 percent) to this report's estimate of 2,175,300 public school teachers in 1981-82 gives an estimate of 134,900 positions that would normally need to be filled by new teachers.

The additional decrease of 36,000 positions remaining from the NCES *projection* of a drop of 63,000 positions between fall 1980 and fall 1982 (after subtracting this Memo's 1980 to 1981 drop of 27,000) would reduce the demand for new teachers to 98,900 in fall 1982. If the decrease of 13,500 teaching postions *estimated* by NCES for fall 1982 is realized, the demand for new teachers would be 121,400 in fall 1982. If the decrease of 19,255 positions compiled by NEA Research for fall 1982 is observed, the demand for new teachers would be 115,645 in fall 1982.

D4. Beginning teachers versus reentering teachers: The primary sources of new teachers are the recent graduates prepared to teach and the former teachers desiring to reenter active employment. A few positions are filled by teacher-education graduates from previous years who have been employed as substitute teachers as they await a chance for employment or who have been otherwise employed or out of the job market. Also, some positions are filled by persons who may not have completed teacher-preparation programs (persons retiring from other occupations, transferring from other employment to teach occupational skills, etc.).

The mixture of beginning versus experienced teachers that is employed is difficult to estimate accurately. Many school systems fill most of their positions with less expensive beginning teachers as a result of financial constraints. Others, with relatively few positions for new teachers, may have commitments to rehire some who have been on sabbatical, administrative, or personal leave.

Projection of the number of beginning teachers (75,000) from the 52.1 percent of 1979-80 teacher-education graduates reported to have received teaching jobs suggests that about two-thirds of the 111,500 jobs open to new teachers in fall 1980 were filled by beginning teachers. This estimate is not highly accurate because follow-up information was reported for only 68 percent of graduates prepared to teach, and the employment status for 20 percent of these was not known.

These findings, coupled with the continuing financial constraints experienced by local school systems, lead to an estimate that about 70 percent of the new teachers in 1981 were beginning teachers. This assumption provides the estimate that 76,500 of the 109,550 positions open to new teachers in fall 1981 were filled by beginning teachers.

The 33,00 reentering teachers and other nonbeginning teachers estimated to be employed in fall 1981 is 1.5 percent of all teachers in 1980-81. This reentry rate is slightly lower than the 1.8 percent rate used in previous editions of this report. This reduction seems credible in view of the continuing pressures for local school systems to employ the least expensive applicants.

D5. Future demand for teachers: The outlook for change in the student enrollment component of the demand for new teachers is summarized in Chart E and in Tables 8 and 4. The chart shows that the number of children five through eight years of age is lower than it has been for many years but that it will increase in future years. The graph also shows that the numbers of persons aged 12 through 17 will decrease throughout the 1980's. By spring of 1985, the number of six-year-olds will have increased from the present lowest levels in recent history. By spring of 1987, the number of six-year-olds is likely to have returned to the number observed about 1972.

The bar graphs below the line graph in Chart G show the trends of recent and near-future numbers of children in the age groupings normally enrolled in primary, elementary, intermediate-junior high school, and senior high school grade levels. For each grouping except the primary grades, the numbers of children and youth will not increase between 1983 and 1987.

The projected demand for beginning teachers in future years shown in Table 4 (Column 5) is based on the NCES projections of the total number of teachers employed, with the application of a constant rate of positions opened to beginning teachers as a result of teacher turnover. As shown in Chart G and Table 8, the enrollment-based growth projected in jobs for teachers will be almost entirely at the primary grade levels.

Teachers are needed each year to replace those who die or retire. These positions are included in the estimate of positions opened by teacher turnover. The advancing average age of teachers has raised questions about the present and immediate future impact of teacher retirements on teacher turnover rates. Summarized in Chart H and Table 9 are the percents of teachers within 15 years of the age or normal retirement in 1981-82 and in selected earlier years.

The percent of teachers who are age 50 or above was 17.9 percent in 1981-82. This is somewhat lower than the sampling estimate of 19.4 percent in 1980-81 and is lower than the estimates for the years prior to 1976. The percent of teachers who are age 40 to 49 years of age is higher in 1981-82 than in any of the earlier years except 1956.

TABLE 8.—ESTIMATES OF POPULATION AT SPECIFIC SCHOOL GRADE LEVELS, BIENNIALLY, FALL 1979 THROUGH FALL 1987

Population by age on July 1, 1982	Grade level in which most of population would normally enroll				
	Fall 1979	Fall 1981	Fall 1983	Fall 1985	Fall 1987
1	2	3	4	5	6
21 — 4,490					
20 — 4,269	12				
19 — 4,240	11				
18 — 4,185	10	12			
17 — 4,006	9	11			
16 — 3,760	8	10	12		
15 — 3,338	7	9	11		
14 — 3,547	6	8	10	12	
13 — 3,634	5	7	9	11	
12 — 3,731	4	6	8	10	12
11 — 3,728	3	5	7	9	11
10 — 3,374	2	4	6	8	10
9 — 3,251	1	3	5	7	9
8 — 3,125	K	2	4	6	8
7 — 3,195		1	3	5	7
6 — 3,134		K	2	4	6
5 — 3,239			1	3	5
4 — 3,223			K	2	4
3 — 3,554				1	3
2 — 3,553				K	2
1 — 3,591					1
Under 1 — 3,649					K
Number in age group for enrollment in grades					
10-12	12,694	11,951	10,645	10,912	10,833
7-9	11,104	10,519	11,093	10,353	9,571
4-6	10,912	10,833	9,750	9,454	9,596
K-3	13,478	12,705	12,791	13,569	14,347
K-12	48,188	46,008	44,279	44,288	44,347

The estimated annual number of jobs opened by retiring teachers (Table 9, Column 4) is not as large as the numbers similarly estimated for the 1960's and 1970's. Because the number of graduates has been decreasing during the 1970's, the projected demand to fill positions opened by retiring teachers in 1981-82 is a higher proportion of teacher-education graduates than was observed between 1965-66 and 1976-76. However, the demand to fill positions opened by retiring teachers during the 1950's and early 1960's accompanied annual increases in the total number of teachers. Growth in teaching positions during the 1980's will be much smaller than during these earlier years.

TABLE 9.—PERCENT OF TEACHERS AGED 50 OR MORE, AVERAGE ANNUAL RETIREMENTS ESTIMATED FOR SUBSEQUENT 15 YEARS, NUMBER OF GRADUATES PREPARED TO TEACH, AND RETIREMENT DEMAND AS PERCENT OF TEACHER-EDUCATION GRADUATES, QUINQUENNIALLY, 1955-56 THROUGH 1980-81, AND 1981-82

Year	Teachers aged 50 or over		Average number to retire each year during next 15 years	Teacher-education graduates of previous year	Average annual demand for retirement as percent of number of teacher-education graduates
	Percent of all teachers	Estimated number			
1	2	3	4	5	6
1955-56	30.2%	344,600	23,000	87,400	26.3%
1960-61	29.2	411,100	27,400	130,200	21.0
1965-66	25.6	437,800	29,200	190,200	15.4
1970-71	22.3	458,300	30,600	284,300	10.8
1975-76	16.5	362,300	24,200	238,200	10.2
1980-81	19.4	419,600	28,000	143,900	19.5
1981-82	17.9	379,300	25,300	140,600	18.0

SOURCES: NEA Research, Status of the American Public School Teacher
NEA Research, Teacher Supply and Demand in Public Schools

The percent of teachers who are 40 to 49 years of age increased from 17.8 percent in 1971 to 25.0 percent in 1982. This growth points to increase during the 1980's in the numbers of teachers who are age 50 or over. However, even by 1990, the proportion of teachers in the age-50-or-over group probably will not equal that observed in 1966 and earlier years. Therefore, only small increases in the numbers approaching retirement age are on the horizon during the 1980's.

However, increases in the number of annual retirements during the 1990's will be followed in the early 2000's by further increases. Almost two in five teachers (38.8 percent) in 1980-81 were 30 to 39 years of age.

D6. Teachers needed to improve school quality: The requirements, expectations, and demands of an increasingly more complex society dictate improvements in the quality of schooling provided to those enrolled as well as increases in the proportion of the school-age population who complete programs designed to prepare them for productive and rewarding lives. Limitations of both financial and personnel resources have prevented schools from providing in all locales the quality of education needed. As research and experimentation provided direction for improved instructional methods, materials, and content, the schools have changed and enlarged their offerings. During the era of significant annual growth in the number of students, the supply of qualified teachers was not adequate for expediting the rate of school improvements needed even if funds were available. Now the primary limitation on the rate of school improvement is the lack of funding. However, gradual improvements occur even during financial crises as an outcome of continuous public interest in and support for keeping the schools up to date.

The estimates in this section (see Chart I and Table 10) are not highly accurate because pertinent statistics in the areas of concern are not available. However, the material provides information that can be useful in studying and planning for local school improvements as well as in estimating the national personnel requirements for raising the quality of schools immediately.

TABLE 10.—DEMAND FOR NEW TEACHERS BASED ON THE QUALITY CRITERION, 1981

Source of demand	Estimated demand for new teachers		
	Elementary	Secondary	Total
1	2	3	4
Enrollment change and trends toward improved staffing	-12,000	-15,000	-27,000
Teacher turnover	74,300	62,250	136,550
Temporary replacement of teachers having substandard qualifications	1,900	2,400	4,300
Reduction in number of overcrowded classes	127,500	125,400	252,900
Enlarged numbers enrolled in special education	35,000	22,250	57,250
Enlarged numbers enrolled in kindergarten and nursery school	10,800	— —	10,800
Reduction in number of misassigned teachers	21,000	30,600	51,600
Enlargement of school offerings	10,000	40,000	50,000
TOTAL	268,500	267,900	536,400

D7. Temporary replacement of teachers having substandard qualifications: In the absence of valid statistics on the number of currently employed teachers without minimum teaching qualifications, the minimum educational requirement for qualified teachers is assumed to be completion of the bachelor's degree. Special circumstances supporting the continued employment of those without a bachelor's degree reduce the validity of the estimate of the number who should be replaced. Also, the replacement of those teachers who lack only one or two years of college may be on just a short-term basis while they return to school to complete a degree.

Data from a sample survey of public school teachers show that 0.2 percent of elementary and 0.3 percent of secondary teachers in 1980-81 lacked the bachelor's degree. It is assumed that 20 percent of those without the degree either resigned or completed degree requirements during that school year, resulting in an estimated 4,300 teachers without a bachelor's degree who needed to be replaced in fall 1981 (for at least the short term) by qualified teachers.

D8. Reduction of overcrowded classes: A nationwide 1980-81 NEA Research survey of a sample of public school teachers provided an estimate of the distribution of teachers by their average class size. These percentage distributions—applied to the total number of teachers employed in 1980-81 to estimate how many may have been assigned extremely large classes—indicated that 252,900 additional teachers were needed in fall 1981 to reduce maximum class size to 24 students. The number of assignments in which larger numbers of students than indicated by this standard may be acceptable is probably more than offset by the number of assignments in which the class size should be far smaller than this maximum.

The most productive approach to improving the quality of public education probably would be to achieve the staff requirements for this quality demand component. The problems most frequently encountered by teachers directly relate to oversized classes. Also, for many instructional objectives and assignments, class size makes a significant difference in the quality and effectiveness of instruction.

D9. Larger numbers enrolled in special education: At least 57,250 additional teachers are needed to provide special education for all children of school age who require it. The Office of Special Education and Rehabilitative Services of the U.S. Department of Education indicates in its 1982 report that the states anticipated a need of 53,210 new special-education teachers in school year 1980-81 and 43,192 in school year 1981-82. (*Fourth Annual Report to Congress on the Implementation of Public Law 94-142: The Education for All Handicapped Children Act*, p.9). The 1981 report from that agency had indicated a discrepancy of 57,250 new teachers between the numbers needed and available between the spring and fall of 1980. When the estimates for this Memo were being prepared, the 1981 report was the best national statistic available. The estimate in this Memo of 57,250 new teachers is not unreasonable in view of evidence suggesting higher turnover rates among special-education teachers than among other teachers and the strong possibility that shortages of qualified applicants prevented the filling of all of the new postions open in fall 1980.

The Department of Education report says that the specialties within special education having the greatest need for growth in the coming years will be teachers of the multihandicapped, emotionaly disturbed, hard of hearing and deaf, and orthopedically impaired. Further, the states are reported to have current critical shortages of teachers of the emotionally disturbed due to high rates of teacher attrition and burnout. Some states are reported to have shortages of physical therapists and occupational therapists as an outcome of the limited numbers preparing for and meeting certification requirements of these specialties.

D10. Larger numbers enrolled in kindergarten and nursery school: A minimum of 10,800 new teachers is needed to provide kindergarten for the same proportion of five- and six-year-old children as that of seven-year-olds now enrolled in school. This does not include the number of new teachers needed to replace present kindergarten teachers with substandard qualifications or to improve the pupil-teacher ratio. The U.S. Bureau of the Census estimates that in fall 1980, more than 260,000 five- and six-year-old children were not enrolled in school.

D11. Reduction in the number of misassigned teachers: At least 51,600 new teachers are needed to reduce the impact of the misassignment of teachers. A 1980-81 NEA Research survey showed that 3.5 percent of elementary and 6.1 percent of secondary school teachers were teaching full time in an assignment outside of their major field of preparation. Probably some of these teachers have already been reassigned, and some have adequate qualifications despite the fact that they are not working in the field of their major preparation. Therefore, the 51,600 new teachers estimated for this area is one-half of the 103,200 teachers estimated to have been teaching full time out of their major area of preparation in 1980-81. This estimate may be conservative because it does not include the number of new teachers needed for the reassignment of the more than 57,000 teachers teaching at least three-fourths but not all of their time in assignments outside of their major field of preparation.

D12. Enlargement of school offerings: At least 50,000 new teachers are needed to enlarge elementary and secondary school offerings. Some of these are needed to provide expanded school offerings for the first time in many school systems. Others are needed to reinstate programs that have been severely curtailed as a result of financial constraints and cutbacks. In some locales, instruction has not been offered in subjects widely accepted as basic to public education.

At least 1,000 new elementary school teachers are needed to provide at least one fine arts teacher in each of the 1,000 school systems reporting the absence of elementary school instruction in the fine arts in 1979-80. At least 32,000 new teachers are needed to enlarge the

scope of secondary school offerings. In 1979-80, more than 3,250 systems reported the absence of fine arts, industrial arts, vocational education, work-study, and/or performing arts program. Providing two teachers for each of these five programs alone in these school systems would require more than 32,000 new teachers. The remaining 17,000 positions in this estimate are for the reinstatement of programs and offerings that have been discontinued recently as an outcome of financial cutbacks and constraints on local school systems.

Part 3: SUPPLY COMPARED TO DEMAND

SD1. Surplus of teachers: The estimates of supply and demand for new and beginning teachers for fall 1981 are summarized in Table 11. Perspective about the status of teacher supply and demand in 1981 is provided by information in Chart K and in Table 4. Information about the supply and demand for teachers in each major assignment category is given in Table 12 and in Chart J.

The conclusion that supply is larger than demand for beginning teachers is supported by the employment status of 1980 graduates completing preparation to enter teaching. Among those for whom follow-up information was reported, 52.1 percent secured teaching positions (55.9 percent of those prepared for elementary, 46.1 percent for secondary, and 62.9 per cent for special education). Institutions reported the employment status as of Nov. 1, 1980, of all graduates who had completed preparation to enter teaching for the first time in 1980. Reports were received from at least one institution in all states except California, North Dakota, and Texas. Information was reported for less than half the graduates completing preparation in Alabama, Arizona, District of Columbia, Florida, Kentucky, Massachusetts, Mississippi, New Hampshire, New Mexico, Rhode Island, and Vermont. Overall, follow-up information was reported for 68.4 percent of the 1980 graduates prepared to enter teaching.

TABLE 11.—SUPPLY OF AND DEMAND FOR PUBLIC SCHOOL TEACHERS, FALL 1981

Level and category of personnel	Supply	Demand to achieve minimum quality (Quality criterion estimate)			Actual demand (Adjusted trend criterion estimate)		
		Demand	Supply minus demand	Supply as percent of demand	Demand	Supply minus demand	Supply as percent of demand
1	2	3	4	5	6	7	8
Elementary schools							
Beginning teachers . . .	56,450	203,300	-146,850	27.8	44,300	12,150	127.4
Reentering teachers . .	65,200	65,200	0	100.0	18,000	47,200	362.2
TOTAL new teachers . .	121,650	268,500	-146,850	45.3	62,300	59,350	195.3
Secondary schools							
Beginning teachers . . .	52,500	235,300	-182,800	22.3	32,250	20,250	162.8
Reentering teachers . .	32,600	32,600	0	100.0	15,000	17,600	217.3
TOTAL new teachers . .	85,100	267,900	-182,800	31.8	47,250	37,850	180.1
Total Elementary and Secondary							
Beginning teachers . . .	108,950	438,600	-329,650	24.8	76,550	32,400	142.3
Reentering teachers . .	97,800	97,800	0	100.0	33,000	64,800	296.4
TOTAL	206,750	536,400	-329,650	38.5	109,550	97,200	188.7

TABLE 12.—SUPPLY OF AND DEMAND FOR BEGINNING TEACHERS IN PUBLIC SCHOOLS BY TYPE OF ASSIGNMENT, FALL 1981

Assignment area	Estimated number completing preparation to teach	Estimated supply	Estimated demand	Supply minus demand	Supply as percent of demand	Opinions of college placement officers in October: Average rating of supply versus demand as percent of rating used to denote balance between supply and demand 1981[a]	Opinions of college placement officers in October: Number of nine regions in which the average rating signifies shortage of teachers[b] 1981	1982
1	2	3	4	5	6	7	8	9
ELEMENTARY TOTALS	67,870	56,450	44,300	12,150	127.4	[c]	[c]	[c]
Regular instruction	55,900	47,250	33,050	14,200	143.0	132.7–148.5	0	0
Special education	11,970	9,200	11,250	-2,050	81.8	71.4–80.4[d]	9[d]	7
SECONDARY TOTALS	72,780	52,500	32,250	20,250	162.8	[c]		[c]
Agriculture	1,030	740	615	125	120.3	68.9	9	6
Art	3,930	2,810	1,095	1,715	256.6	163.0	0	0
Business education	3,995	2,855	1,355	1,500	210.7	86.5	1	1
Distributive education	320	230	260	-30	88.5	[c]	[c]	[c]
English language arts (total)	8,760	6,265	3,710	2,555	168.9	93.5	1	0
Foreign languages (total)	2,190	1,565	740	825	211.5	111.9–120.5	0	0
Home economics	3,090	2,210	1,095	1,115	201.8	123.5	0	0
Industrial arts	2,385	1,705	1,030	675	165.5	68.8	8	5
Mathematics	2,705	1,935	2,355	-420	82.2	62.4	9	9
Music	6,245	4,465	1,645	2,820	271.4	91.5–101.7[d]	2[d]	0
Physical and health education—boys	8,115	5,800	1,225	4,575	473.5	174.4	0	0
Physical and health education—girls	7,145	5,110	1,225	3,885	417.1	174.4	0	0
Natural and phyical sciences (total)	4,445	3,175	2,130	1,045	149.1	68.0–82.0[d]	8[d]	7[e]
Social sciences (total)	8,755	6,265	2,065	4,200	303.4	142.2	0	0
Trade, industrial, vocational, technical	1,160	830	2,160	-1,330	38.4	[c]	[c]	[c]
Other secondary subjects	130	90	1,385	-1,295	6.5	[c]	[c]	[c]
Special education	8,380	6,450	8,160	-1,710	79.0	71.4–80.4[d]	9[d]	7[e]
TOTAL Elementary and Secondary	140,650	108,950	76,550	32,400	142.3	93.8	0	0

[a] Evaluation scale was 5-considerable shortage, 4-slight shortage, 3-balanced, 2-slight surplus, 1-considerable surplus. To provide percentage estimates consistent with Column 6, the reciprocal of the ratio is reported.

[b] Included are regions in which the average rating was 4.0 or higher (slight shortage to considerable shortage).

[c] Not included in survey.

[d] *Music*—citations were for instrumental but not for vocal music. *Natural and phyical sciences*—citation numbers were for the following specific subjects: biology (2), chemistry (8), earth science (3), and physics (3). *Special education*—citation numbers were for the following specific areas: PSA (5), gifted (5), learning disabled (7), mentally retarded (2), multiple handicapped (5), reading (5), and speech and hearing (6).

[e] *Natural and physical sciences*—citation numbers were for the following specific subjects: Biology (2), chemistry (6), earth science (5), and physics (3). *Special education*—citiation numbers were for the following specific areas: PSA (5), gifted (4), learning disabled (5), mentally retarded (1), multiple handicapped (3), reading (2), and patho./audiology (6).

A report of the percents of teacher-education graduates entering teaching in each year from 1967 through 1980 is given in Chart K and in Table 4. Column 7 of the table shows that the percent employed as teachers in 1980 is still somewhat higher than those observed in several years preceding 1979 but is considerably lower than the levels observed before 1970.

Column 9 of Table 4 shows that a record 13.4 percent of 1980 teacher-education graduates entered other gainful employment. Also, the employment status was not known for about one in five of these graduates.

Regional differences in the percents of teacher-education graduates who entered teaching in the fall following graduation are an indication of differences in supply-demand conditions among the states. However, because these percentages may be influenced by factors other than supply and demand, the differences must be treated in very general terms.

Use of one rate of teacher turnover (applied to the number of teachers), taken with the state change in the total number of teachers employed, makes it possible to estimate the numbers of jobs that may be open to beginning teachers in each state. Comparison of this estimate of demand to the number of teacher-education graduates in each state provides an additional estimate of the relative adequacy of the supply of begining teachers. These procedures provide two widely differing estimates of the relative status of a given state with regard to the adequacy of its supply of teacher-education graduates.

A summary of assessment of the status of teacher supply and demand by subject area and by geographic region has been released by the Association of School, College, and University Staffing (ACUS). The overall rating of teacher supply and demand conditions in each of nine geographic regions was reported by a sample of college placement officers. Groups of states having least adequate numbers of applicants were in the South Central, Great Plains/Midwest, Great Lakes, Southeast, and Rocky Mountain regions. The Northeast and Northwest states received ratings of having the most adequate supplies.

The NEA Research survey of follow-up status of graduates prepared to teach found that the percentage of graduates entering teaching jobs was higher in the Southwest (71.4 percent) and in the Plains states (63.2 percent) than in other regions. Other states having a relatively high proportion of graduates (63.0 percent or more) reported to have entered teaching include: Georgia, Idaho, Kentucky, Maine, and Wyoming.

States in the Middle Atlantic and Northeast or New England regions are probably the most adequately supplied with prospective teachers. Placement success of graduates prepared to teach has been lower in these regions than in others, and higher education placement officers in the ASCUS survey ranked these two areas among the bottom three of nine geographic regions in severity of teacher shortages. The states in these regions include: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

Teaching jobs are being added in 1981 and in 1982 by enrollment growth in several states (Texas, Arizona, Florida, Utah, Nevada, Wyoming, New Hampshire, Alaska, and Hawaii). As a whole, the states in the Rocky Mountain and Southwest regions have had significant increases in the number of annual births during the 1970's that will be reflected in elementary school enrollment growth during the middle 1980's. On the other hand, the later and less-marked increases in the number of annual births in most Northeast, Middle Atlantic, and Great Lakes states make them least likely to experience significant elementary school enrollment growth during the middle 1980's.

SD2. Supply and demand by assignent: Supply and demand estimates for beginning teachers by subject assignment are listed in Table 12 and Chart J. The supply of graduates actually available for a given assignment is 84.5 percent of those prepared for elementary-level assignments and 77.0 percent for special-education assignments. The supply for each assignment is derived by applying to the numbers of graduates the percentage distribution of teacher-education graduates observed in a special survey in 1978-79 by the American Council on Education (*Newly Qualified Elementary and Secondary School Teachers, 1977-78 and 1978-79.*) The demand for each assignment is estimated by apportioning the total demand for the level in which the assignment is classified. This is done on the basis of the percentage distribution of the number of beginning teachers among these assignments reported by nine states last year.

Using the assumption that the proportion of graduates seeking teaching positions is the same for all assignment areas, the supply of prospective teachers from the 1982 class to fill jobs open to beginning teachers in fall 1981 exceeded the demand in most assignment areas. Exceptions were special education, distributive education, mathematics, trade-industrial-vocational-technical, and other secondary subjects not identified.

The estimate of an undersupply of graduates who are available for trade-industrial-vocational-technical and other secondary subject positions in secondary schools is of questionable accuracy. This is because (1) teachers entering these assignments may not come from the current graduating class (i.e., work experience in the specific occupation or technology may be required), (2) the wide variety of assignments in these categories makes it difficult to

identify which programs of teacher preparation might need to be enlarged, and (3) a relatively small number of teachers are in these assignments (i.e., the open positions may be filled by a small proportion of those graduates prepared for more than one assignment who have been listed as completing preparation for other assignments).

The number of regions in which the college placement officers in 1981 estimated that there was more than a "slight shortage" of teacher-applicants is shown in Column 8 of Table 12. Response options ranged from "considerable shortage" to "considerable surplus" on a five-point scale. These opinions provide a useful identification of the extent to which some assignment areas may be influenced more severely than others by conditions that reduce the adequacy of the estimated supply of prospective teachers. Such conditions include greater attractiveness of jobs outside teaching for graduates prepared for the assignment, greater separation rates among teachers in a given assignment, and/or inaccurate estimates of supply/demand resulting from the samples of institutions and states included in the studies leading to inaccurate estimates of the distribution of graduates or beginning teachers by assignment. The opinions of these officers support the conclusion that most of the areas listed with the smallest ratio of supply to demand have the greatest shortages. The judgments of these officers point to the additional areas of agriculture, industrial arts, and natural and physical sciences as having a less adequate supply of applicants than is suggested by the numerical estimates.

The significance of present supply-demand conditions can be interpreted more accurately in the perspective of estimates for earlier years. For example, several years of annual shortages followed by an estimate of a shortage in a given year points to a serious problem for an assignment area. Mathematics has been reported to be in either a shortage or low-supply condition in each of the last 20 years, with shortages becoming more acute in the late 1970's. Only slightly less severe conditions have been estimated for most of these years for the natural and physical sciences. Special education has been estimated to be in a shortage or low-supply condition almost every year since becoming an assignment category in this report in the late 1960's. Low supplies or shortages have been estimated for industrial arts and for agriculture during the 1970's, with the shortages becoming more severe toward the end of the decade. During the past decade, the other assignment areas for which reasonably accurate estimates can be calculated have been adequately supplied with applicants.

In summary, among the assignment areas for which reasonably accurate estimates can be made, the supply is least adequate in mathematics, natural and physical sciences, special education, industrial arts, agriculture, and distributive education. Subjects or assignments in which the supply most widely exceeds actual demand include social studies, physical and health education, art, and music.

SD3. Elementary school teachers will increase: The population information in Chart G shows that enrollments will grow in the primary grades shortly after 1983 but that those for other groupings will stay near present numbers or continue to decline. The graph shows that the rates of increase in the primary grades will be not unlike the rates of decrease in the numbers potentially enrolled in these grades over the past five years. The estimated number of live births during the year ending March 1983, shows that the rates of increase are likely to decline in 1987, after two years of major growth, in the number of six-year-olds beginning in 1985.

The projections of numbers of teachers to be employed in future years (shown in Table 4) are based on U.S. Census projections of the number of births after 1980 and include an assumption that the student-teacher ratio will continue to decline. The actual number of births has dropped behind the projected number for Fiscal 1982 by almost 180,000. Therefore, the projected upturn in numbers of teaching jobs shown in Column 5 of Table 4, may not be fully realized.

The summaries in Tables 11 and 12 show there was a surplus of qualified applicants for elementary school assignments in 1981. This surplus condition was also reported each year during the 1980's.

Therefore, a severe shortage of prospective primary teachers does not seem likely in the 1980's unless further decreases in the number prepared and/or continuing to teach result from reductions in the attractiveness of employment in teaching.

SD4. Shortage of teachers for quality education: The information in Columns 2 through 5 of Table 11 shows the levels of supply and demand for teachers if staffing adjustments were made immediately to bring the quality of schools up to minimum levels. Even if all of the estimated 97,800 former teacher-applicants in 1981 were placed in appropriate assignments, there would be a shortage of more than 300,000 qualified teachers

SD5. If teaching employment becomes less attractive: The information in Table 13 and in Charts C, D, and E shows that salaries paid to public school teachers are not competitive with other appropriate employment opportunities for college graduates and that teaching salaries are less competitive now than they were in the mid-1970's. The evidence of loss among potential teachers of agriculture to more attractive employment in other fields (Section II, S5) is probably representative of conditions in mathematics, sciences, industrial arts, and vocational-technical assignments.

The inability of public education to attract and hold qualified teachers in these fields will continue unless teaching salaries and working conditions are improved. Further reductions in the selectivity of teacher-preparation institutions and of employing school systems will lead to increasingly widespread qualitative decline as well as numerical shortages of teacher-applicants. Teacher morale seems likely to remain low unless improvements are made in the teaching career outlook for satisfaction in salaries and in working conditions.

TABLE 13.—STATUS OF TEACHERS' SALARIES COMPARED TO EARNINGS OF ALL COLLEGE-EDUCATED WORKERS

	Mean contract salaries of public school teachers			Mean annual total money earnings of year-round full-time workers		Teachers' salaries as percent of salaries for all workers	
Year	Bachelor's or Less	Master's or More	Year	Four years of college	Five or more years of college	Bachelor's or four years of college	Master's or more, or five or more years of college
1	2	3	4	5	6	7	8
1975-76	$10,976	$13,702	1975	$15,794	$19,741	69.5%	69.4%
			1976	16,677	21,702		
1977-78	12,338	15,554	1977	18,156	22,984	68.0	67.7
1978-79	12,959	16,556	1978	19,498	24,117	66.5	68.6
1979-80	13,866	17,455	1979	21,052	26,367	65.9	66.2
1980-81	15,128	18,710	1980	22,832	27,628	66.3	67.7

SOURCES: Teacher's Salaries: Surveys by NEA Research.
Worker's Salaries: U.S. Department of Commerce, Bureau of the Census, Current Population Report, Series P-60, *Consumer Income*, "Money Income of Families and Persons in the United States."

SD6. If attractiveness of teaching salaries and working conditions remains near present levels: Despite recent reductions in the attractiveness of salaries for teaching (shown in Table 13 and in Charts C, D, and E), the supply continues to be numerically ample for most assignment areas. The lack of competitiveness in teachers' salaries and working conditions seems to be a major causal factor in the shortages experienced in some assignments (mathematics, natural and physical sciences, industrial arts, agriculture, vocational-technical subjects, and special education). Even if larger numbers could be persuaded to prepare for these shortage fields, there seems to be a strong likelihood that many would still opt for the more attractive salaries and working conditions outside teaching.

The information in Tables 5 and 7 demonstrates the responsiveness of college students to supply-demand conditions in most assignment areas. This responsiveness averted the development of huge annual surpluses during the 1970's. It is also likely to prevent the development of shortages during the middle and late 1980's when additional numbers may be needed for elementary school and special-education assignments. Appropriate employment opportunities for college graduates are not expected to become sufficiently widespread either to significantly reduce the numbers preparing and applying for teaching jobs in most of the assignment areas currently well supplied or to prevent needed growth in some assignment areas.

Professional and public concern about the qualitative aspects of teacher supply will probably grow if nothing is done to halt the accumulating effects of the recent declines in the attractiveness of teaching jobs that are becoming more widely evident.

SD7. If teaching salaries and working conditions are improved: Evidence from the survey of graduates prepared to teach agriculture (Section II, S5) point to the loss of needed prospective teachers as a result of more attractive employment outside teaching. Reduction of this type of loss would alleviate considerably the shortages presently reported in mathematics, natural and physical sciences, industrial arts, agriculture, and vocational-technical subjects. Placement officers report shortages in these fields while the estimates in Table 12 show for many of them an adequate supply. This suggests that the proportion of graduates in these fields who apply for teaching jobs is lower than for graduates in other fields.

Increases in the numbers prepared for mathematics and special education probably are needed in addition to improved job attractiveness.

Improvement of teaching salaries and working conditions, in addition to increasing the supply of qualified applicants, probably would lower the demand for new teachers by increasing the proportion of qualified teachers who elect to remain in teaching.

The relatively low attractiveness of salary and working conditions suggests that the decision to seek employment in education may be a second choice for many graduates prepared to teach. Increases in the attractiveness of teaching jobs would reduce the extent to which applicants view employment in education as a last resort.

The relatively low mobility of teachers will likely continue during the 1980's as a result of the small growth in the number of teaching jobs. The reduced opportunities for teachers to achieve job satisfaction by moving to a desirable location imply that every school system needs to give greater attention to improving its career incentives for teachers. These incentives include higher beginning salaries, growth to higher career salaries, and improved working conditions.