



P A C E

POLICY ANALYSIS FOR CALIFORNIA EDUCATION

WORKING PAPER SERIES

*The Need for Teachers
in California*

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Policy Analysis for California Education

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PREFACE

The paper that follows, "The Need for Teachers in California," is a baseline analysis of how many teachers will be needed in California over the next ten years. By baseline analysis, we mean that the authors have taken data on student enrollment projections and looked at several variables that affect the number of teachers available in the years to come. These variables include the expected rate at which new teachers come into the profession and the rate at which teachers retire. Both of these variables are difficult to estimate.

The baseline analysis that is presented does not try to include several critical events that have occurred in recent months that are critical to this policy discussion. First, the 1996-97 budget calls for reductions in class size in grades 1, 2, and 3. Reductions in classes from 30, or more, to 20 will require additional teachers in the coming years as the policy is phased in. This will increase the need for teachers beyond what is described in the pages that follows.

Second, teacher credentialing is an area of active policy development in California at this time. New options for prospective teachers have been proposed by researchers, the California Commission on Teacher Credentialing, and legislators. Several bills on credentialing are pending in the state legislature at this time that look to change credentialing requirements and broaden the ways in which credentials can be earned. These changes, too, will have a direct impact on the need for teachers in California and the authors of this paper have not attempted to analyze the likely effects of these changes.

While these complicating policy changes are not reflected in the analysis, the regional nature of teacher shortages is clearly demonstrated and will likely prevail even with the new policies that have been developed.

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EXECUTIVE SUMMARY

Projections indicate that nearly six million students will be enrolled in California public schools by the beginning of the next century. Further projections indicate that the state will require approximately 200,000 new teachers over the next ten years to meet the increase in the number of students, and that shortfalls will result unless steps are taken to maintain the current work force of experienced teachers and to recruit new teachers.

PROJECTED TEACHER NEED

California currently employs roughly 218,500 teachers in kindergarten through grade twelve. Assuming average pupil-teacher ratios for elementary and secondary schools remain constant:

- For the five year period of 1995 through 1999, California will need between 100,000 and 125,000 new K-12 teachers. Approximately 25,000 new teachers will be required to meet expected enrollment growth. Between 75,000 and 100,000 teachers will be needed to compensate for attrition and retirement of K-12 teachers.
- For the ten year period through 2004, California will need between 207,000 and 259,000 new teachers. Approximately 48,000 new teachers will be required to meet expected enrollment growth. Between 159,000 and 211,000 teachers will be needed to compensate for attrition and retirement of K-12 teachers.

PROJECTED NUMBER OF TEACHERS AND SHORTFALL

It is estimated that only 9,000 teachers will enter the profession each year, far short of the amount that will be needed. Roughly 5,000 of these teachers will be newly credentialed while another 4,000 can be expected to return to teaching from the reserve pool. Therefore, over the next ten years, there is expected to be a shortfall of credentialed teachers, and emergency or intern teachers will likely be called upon to fill the gap. Moreover, it is likely that California will have to intensify its recruitment of out-of-state teachers.

PROJECTING THE NEED FOR TEACHERS

California needs to do a better job of projecting the need for its teachers and its ability to meet this demand. Student enrollments continue to rise. The demography of the student body is also changing, due to immigration and high birth rates, creating new demands for teachers. But resources for education are limited and these changes will create a strain on the system. Thus, California must ensure that it has an adequate number of qualified teachers who are prepared to meet the needs of its students. Without this necessary first step, it will be difficult to maintain present levels of educational quality and will hamper goals to improve it in the future. The state must therefore better understand the need for the number of likely teachers in order to create and implement new policies to ensure that shortfalls do not occur in the future.

In the past, California has not been able to meet its teaching needs with fully credentialed teachers. Teacher shortfalls have been compensated for by hiring non-certified teachers, typically those with emergency credentials, who may not be capable of providing quality education. Furthermore, the number of teachers in certain sectors of the “education market” is insufficient to meet the need, resulting in shortfalls in certain subject areas and geographical regions. For several years, the need for bilingual teachers has outstripped the number available as many districts continue to have openings for bilingual faculty. Moreover, geographic and economic differences affect teacher need. Although most Marin County school districts, for example, rarely experience difficulty filling open positions, the Los Angeles Unified School District is

often forced to fill many open positions with emergency credentialed teachers.

The purpose of this paper is to analyze the need for public school teachers in California into the next century. The authors are particularly concerned with answering the following questions:

- Are there data available with which to effectively estimate teacher numbers and need for teachers?
- Based on available data, will the number of available teachers meet the projected need in California public schools over the next ten years, or will there be a shortfall?

TEACHER NEED RESULTING FROM ENROLLMENT CHANGES

Schools must provide teachers for all of the students who appear each fall. The most important gauge of teacher need is the change in the number of students enrolling in the California schools. California has increasing immigration rates and a high growth rate; moreover it will have rapidly changing demographic conditions. These changes will contribute significantly to rising public school enrollment. The California State Department of Finance provides both a county-by-county historical summary and projections of enrollment in elementary and secondary schools.

County-by-county enrollment projections should also be done for the number of special education students attending California schools, as well as the number of students needing bilingual education, broken down by language category.

LONG TERM TEACHER NEEDS

Identifying Present Teaching Populations

In order to gauge the long-term teaching needs of a particular school or district, the teacher population of each school must be correctly evaluated according to grade level or subject area. Moreover, the number of credentialed teachers must be measured as well as the number of those individuals with emergency credentials teaching in the schools. The California State Department of Education presently is capable of compiling this data, but no convenient databases exist in which the data is easily accessible.

Furthermore, an accurate assessment must be made of those credentialed teachers who teach in areas in which they do not hold credentials. If a teacher, for instance, holds a bilingual credential to teach in Filipino bilingual classes, and yet teaches in a school in which no students need assistance in Filipino, it would be more appropriate to consider the teacher's credential as being part of the reserve pool.

Attrition Rates

A comprehensive model for gauging teacher attrition must be constructed in order to understand the sources of high rates of attrition and construct relevant policy to combat attrition. This model must attempt to measure attrition with respect to:

- Region, district or school: An average state attrition rate will not capture the teacher needs created in those schools with very high attrition rates. The attrition rate may be strongly identified with the location of the schools, poor working conditions, or low salaries

within the schools. In order to identify and target those schools with high attrition rates, the attrition rates in each school or district must be measured.

- **Length of Tenure in Teaching or Age:** The attrition rates of newly credentialed teachers may differ significantly from teachers who have been in the teaching profession for a long time. The reasons for varying attrition rates may range from dissatisfaction with the teaching experience and inadequate support to the ability of newly credentialed teachers to secure jobs in stable teaching environments. Therefore, the rates of attrition for varying age and experience groups must be evaluated in order to devise constructive policy designed to retain these teachers.
- **Presently, newly credentialed teachers who enter the teaching force must enroll with the State Teaching Retirement System (STRS),** which keeps records on the membership and activity of individual teachers over time. An attrition model may be created by tracking a random sample of newly credentialed teachers, obtained from the California Commission on Teacher Credentialing (CTC), with the use of STRS membership activity data.
- **Attrition to Other Schools:** In order to construct a model that evaluates changes in existing teaching pools of districts or specific schools, movement of teachers between schools must be measured.

An average attrition rate for the state may be sufficient to predict general trends. A more precise attrition rate may be necessary to devise short-term policy for improving teacher supply.

Retirement Rates

The demand for new teachers may also depend on the number of retiring teachers, especially if the teaching force is aging. The retirement rates for either individual districts or for the state may be used. Retirement rates in previous studies are fairly low¹, as is the calculated rate in this paper (see Section III. Projections), and thus, an appropriate value may simply be the average retirement rate.

Class Size/Pupil-Teacher Ratio

Class size and the pupil-teacher ratio are two measures of the number of teachers needed relative to the number of students. Using average class size as the measure may be inadequate since it does not capture the variation in the size of classes. For instance, bilingual and special education classes may have significantly fewer students than other classes. The pupil-teacher ratio is preferable since it is a more stable measure of the number of teachers relative to students. Although the ratio may be estimated by looking at state averages, more accurate data is needed for each district since pupil-teacher ratios are set by district-wide contracts. However, this may not be necessary if the variation of pupil-teacher ratios is small over California school districts.

NUMBER OF TEACHERS AVAILABLE

Projecting a reasonable estimate for the number of teachers available is more difficult than estimating the need for teachers. Estimating supply requires more assumptions and more uncertainty.² Not every individual who receives a credential enters teaching, and there is often movement in and out of the teaching profession. The rate of credential renewal cannot be used as a

¹ Cagampang (1986).

² *Id.*

proxy for supply, as many people who have never taught keep their credentials up to date as a kind of insurance policy.³ Given these conditions, our model of teacher supply is comprised of the number of teachers completing teacher preparation programs, a portion of the reserve pool (i.e., those holding credentials but not teaching), teachers holding emergency credentials, and out-of-state credential holders.

Out of State Teachers

Teachers from out of state may apply directly to the CTC for regular credentials after passing CBEST. The CTC may be able to provide data on the number of out of state credentials which were applied for and the number actually issued. Moreover, an estimate must be made as to the number of these teachers who actually enter the teaching force.

Reserve Pool

The reserve pool—the number of individuals in California who hold credentials but are presently not teaching—must be determined accurately. This group of individuals represents a potentially significant supply of teachers, if the public school system is able to provide the proper incentives to encourage these individuals to return to teaching. The size of the reserve pool may actually be much smaller than the number of credentialed teachers not in the teaching force, since many credentialed teachers may have no intention to teach in the future. A method proposed by Helen Cagampang appears to be a reasonable method of calculating the reserve pool.⁴

Cagampang estimated the size of the reserve pool by comparing a random sample of CTC records of valid credentials with membership files of STRS.

³ *Id.*

⁴ *Id.*

The likelihood that reserve pool members would return to teaching was established by creating a focus group and a follow up telephone survey of former teachers. Of those individuals in the random sample of CTC records, only 50 percent still had valid credentials; of this group, 47 percent were still teaching. Thus, Cagampang estimated that approximately 47 percent of the people with valid credentials were still teaching. Using present teaching figures, Cagampang calculated the size of this group. The reserve pool is essentially what remains after subtracting out the groups of people not available as teachers: credential holders who are presently teaching, private school teachers with credentials, those retired, disabled, or deceased, and those who have left California.

Having established the reserve pool, Cagampang asked what proportion of the pool would enter the teaching profession. She conducted a telephone survey of the focus group, asking whether the respondent would be likely to return to teaching. Of this group, only 30 percent indicated that they might return to teaching. Hence, Cagampang concluded that the likelihood that reserve pool members would return lay somewhere between 0 and 30 percent. She further projected that reserve pool members would return to teaching at the same rate that inactive members of STRS return to teaching. This is a plausible assumption since the inactive members are members of the reserve pool, although the fact that they remain members indicates that a bias may exist toward their returning to teaching. This final assumption allows for a calculation of the number of individuals entering the teaching force from the reserve pool.

Finally, by studying the behavior of the reserve pool, and of inactive and active members of the STRS, the stability of the teaching force may be better

understood. If fewer active members transfer to inactive status or seek refunds, or if greater numbers of inactive members return to teaching, then the supply components will be better understood.

Re-entry Rates

The rate of re-entry into the teaching profession of those individuals in the teaching reserve pool must be accurately calculated. While only an overall estimate is needed, it is important to note that the re-entry rate may vary significantly with the region of the state, or the type and location of the school. Although the STRS provides general information on teacher re-entry, it does not provide comprehensive statistics on the general reserve pool of teachers or the composition the pool.

The "Pipeline": Teachers Presently Enrolled in Credential Programs

The CTC compiles data concerning the number of individuals who are enrolled in teacher credentialing programs across the state and of those who receive teaching credential recommendations during a given year. Using the number of recommendations and the number of those individuals who actually enter the teaching pool as new teachers each year, a prediction may be made of those teachers who may in the future enter the profession given the number of individuals enrolled in teacher preparation programs.

Understanding the dynamics of the "pipeline" and the types of credentials that future teachers may hold is essential when measuring the long term supply of teachers.

Newly Credentialed Teachers

The number of newly credentialed teachers provide an upper bound for the number of new teachers available to teach. However, not all newly

credentialed individuals enter teaching. Many may not be able to find jobs which are within commuting distance from their homes or in their area of specialization. Moreover, many new teachers may not apply to schools in which they perceive that teaching conditions are inadequate, especially if they have acquired teaching experience while holding an emergency credential. For instance, schools known for having good working conditions may receive a greater number of applicants than schools with poorer reputations, and thus, are more able to hire quality teachers. It is therefore important to understand how newly credentialed teachers behave after completing a teacher preparation program and what factors influence their decisions to teach.

Emergency Credentialed Teachers

For each of the last four years, the CTC has issued an average of 6,000 emergency multiple subject credentials. The CTC has also issued an average of approximately 5,000 single subject emergency credentials. (Table 11). As an indication of emergency credential need in special subject areas, approximately 3,000 special education specialist emergency credentials and 300 bilingual emergency credentials were issued during each of the last four years. No trends in the number of emergency credentials is readily apparent.

PROJECTIONS

NEED FOR TEACHERS

The need for teachers was projected as a function of three main elements:

- Student enrollment,
- Pupil-teacher ratios, and

- Teacher attrition and retirement.

Projected Enrollment

Total Student Population Enrollment

The California State Department of Finance provides a county-by-county historical summary and projection of enrollment in elementary and secondary schools. (Tables 1, 2, and 3). The Department of Finance also projects enrollment based on ethnicity. (Graph 1). Total enrollment is expected to grow to almost 6 million students by the year 2000 and to approximately 6.4 million by 2004. (Table 3a). This represents a growth of more than one million students, or a greater than 20 percent growth.

By 2004, minority student enrollment is expected to make up almost 70 percent of the entire student population. Approximately 48 percent of the total student enrollment in 2004 is expected to be of Hispanic origin. This represents an increase of 11 percent from 1994. Moreover, other ethnic groups also show rapid growth.

The student population in certain regions is expected to grow more rapidly than in others. For the ten-year period following 1994, public school enrollment in Fresno, Madera, Sutter, San Benito and San Bernadino Counties is expected to rise by more than 30 percent, and enrollment is expected to grow by more than 50 percent in Riverside and Placer counties. (Table 3). Moreover, some counties, including San Francisco county, may see decreasing public school enrollments. (Table 3).

Limited English Proficient Enrollment

In 1994, over one of every five schoolchildren in California (23.1 percent) was limited-English-proficient (LEP). (Table 4).⁵ If current trends continue, by the year 2000, more than one of every four schoolchildren in California are expected to be LEP.⁶ Spanish is, and will continue to be, the primary language of most LEP students. More than 77 percent of all LEP students speak Spanish as their primary language, and this rate is expected to increase slightly during the five to ten years. The next most-often-spoken language is Vietnamese, which is spoken by 4 percent of LEP students.

Class Size/Pupil-Teacher Ratio

Two alternatives are available to estimate of the number of teachers needed per classroom: pupil-teacher ratios and average class size. Both class size and pupil-teacher information can be obtained from the California Department of Education Fact Book.⁷ The average elementary school pupil-teacher ratio is 24.7, whereas the secondary school pupil-teacher ratio is 24.⁸ For elementary schools, the average class size is 28.6 students while the average secondary school class size is 29 students. (Table 5).

Average Pupil-teacher ratios and class sizes vary by county. The pupil-teacher ratio for each county for the 1994 school year was calculated using the total FTEs (full-time teacher equivalents) in each county. The FTEs include teachers responsible for classroom instruction in grades K-12, but not those involved in administrative, adult education, or special education assignments. The average pupil-teacher ratio varied from a high of 26 in

⁵ PACE (1995).

⁶ This is a rough estimate based on historical trends.

⁷ California Department of Education Fact Book (1994).

⁸ The average is taken over the school years 1988-89 to 1993-4.

Orange, Ventura, Riverside and Placer Counties to a low of 13 in Alpine County. (Table 5A).

Need Projections Based on Enrollment Growth

Five Year Demand.

Assuming that pupil-teacher ratios for each county remain constant, California will need to hire an additional 24,985 teachers during the next five years to meet increased demand due to enrollment growth. (Table 5A).

Ten Year Demand.

Assuming that pupil-teacher ratios for each county remain constant, California will need to hire an additional 47,943 teachers during the next ten years. (Table 5A). Moreover, if average California pupil-teacher ratios are kept constant, the number of extra teachers needed each year due to enrollment growth will decline toward the beginning of the next century.

Four counties account for roughly 50 percent of the total expected growth in the demand for teachers in both elementary and secondary schools in the next ten years. Los Angeles County will face an increased need of nearly 11,000 teachers due to enrollment growth. Both San Bernadino and Riverside Counties will need roughly 5,000 teachers each. Seven other counties will need over 1,000 teachers each due to enrollment growth: Orange, San Diego, Stanislaus, Sacramento, Fresno, Contra Costa and Kern Counties. (Table 5A).

Attrition

Attrition rates among California public school teachers were estimated using two figures obtained from previous studies. As a lower bound, an average yearly attrition rate of 5.5 percent was estimated, based on national average

attrition rates taken over a period of years.⁹ As a lower bound, a rate of 7.67 percent was used, based on the results of a previous teacher supply and demand study for California.¹⁰ Based on average pupil-teacher ratios, we expect that between 8,500 and 10,200 elementary school teachers will be needed to compensate for attrition each year, over the next ten years. During the same time period, between 3,200 and 4,200 secondary school teachers will be required each year due to attrition. (Table 6).

Retirement

Approximately 1.3 percent of California teachers retire on average per year, based on STRS retirement data for the last 10 years.¹¹ The teacher retirement rate has not exhibited any trends over the past ten years, yet may show an increase if predictions that the teaching force is aging are correct.¹² Given this retirement rate, roughly 10,600 elementary school teachers will be needed to replace retired teachers through 1999, and about 4,000 secondary school teachers will be needed. Moreover, approximately 22,000 elementary teachers and 8,400 secondary teachers will have to be hired by the year 2004. (Table 7).

Need Projections Based on Attrition, Retirement & Enrollment Growth

The total number of teachers that will be demanded is presented in the following table: (summarizing Tables 8-10):

⁹ U.S. Department of Education (1994).

¹⁰ Cagampang (1986). Cagampang uses STRS retirement and membership data to estimate the attrition rate for both attrition and retirement.

¹¹ Based on 10 year average of STRS retirement rates.

¹² the actual average age of the teaching force over the past ten years may be estimated by using the STRS retirement data, which tracks the ages of teachers presently in active membership. The STRS indicated that the teaching pool is aging. STRS Annual Report, 1994.

	Projected Need: Through 1999	Projected Need: Through 2004
Using class size and an attrition rate of 5.5 percent	85,989	176,922
Using class size and an attrition rate of 7.67 percent	106,745	220,557
Using pupil-teacher ratio and an attrition rate of 5.5 percent	100,688	207,432
Using pupil-teacher ratio and an attrition rate of 7.67 percent	125,001	258,545

California will demand roughly twice as many elementary school teachers as it will secondary school teachers over these same periods. Moreover, as the table shows, the attrition rate has a significant effect on the number of teachers needed.

TEACHER AVAILABILITY

Teacher availability was calculated using broad estimations of three sources of teachers:

- Newly credentialed teachers,
- Teachers returning from the reserve pool, after a period of time away from teaching, and
- Emergency credential holders.

Newly Credentialed Teachers

From 1990 to 1993, the CTC issued approximately 10,000 multiple and single subject credentials per year to individuals who had not previously held credentials in California. (Table 11). Approximately 60 percent of these

credentials were multiple subject credentials. These figures include both graduates from teacher preparation programs as well as those teachers who moved to California from out-of-state.¹³ The number of multiple subject credentials issued over this period has varied from 7,274 multiple subject credentials to a low of 5,365 in 1992. It appears that fewer multiple and single subject credentials have been issued in the last two years.

Moreover, the CTC has issued almost 23,000 bilingual teaching credentials during the past four years. This includes all credentials issued, and not just those issued to newly credentialed teachers. The number of bilingual credentials issued has increased over the four year period. In 1993, the number of bilingual credentials issued was 8,264, an increase of 2,300 credentials from the previous year. Finally, the number of special education specialist credentials issued has remained at a fairly constant level of 5,000 credentials over the past four years.

The number of newly credentialed teachers who actually enter the profession though is significantly less than the number of credentials issued. An upper bound on the number of teachers who actually enter the teaching profession may be estimated by considering the California STRS Rate of Termination by Entry Age data.¹⁴ For those individuals who entered active membership with the STRS, approximately 50 percent withdrew from active membership for reasons other than retirement, disability, or death after being an active member for less than one year. This figure assumes that an "active member" is a teacher. Furthermore, it does not account for those newly credentialed individuals who do not become members of STRS. If 50 percent of the

¹³ The ballpark percentage of out-of-state teachers is estimated to be between 20 and 30 percent of the total number of newly credentialed teachers. Lee Huddy, personal communication (1995).

¹⁴ California STRS 1988-91 Experience Study (1993).

average number of 10,000 newly credentialed teachers enter the teaching force, approximately 5,000 teachers leave the teaching force each year.

Reserve Pool

We used the scheme devised by Cagampang to estimate the size of the reserve pool and the re-entry rate of those credentialed individuals to the teaching profession. The number of teachers presently teaching in California is approximately 47 percent of all the individuals in the state with a valid credential.

Number of teachers in California schools (1993):	218,484
Number of teachers who have valid credentials:	464,887

In order to get a base figure for those available to teach in the state and who are not presently teaching, we subtracted out each of the following totals from the above figures.¹⁵

Number of teachers in California schools (1993):	218,484
Number teaching in the private schools:	25,000
Number with credentials deceased/retired/disabled:	15,000
Number of teachers moving out-of-state:	5,000

Therefore, the maximum size of the reserve pool is 200,000 individuals who are credentialed but are not presently teaching. However, not all of these individuals can be considered to be part of the “reserve pool” since many would not consider returning to teaching. As discussed previously, Cagampang estimated that only an upper bound of 30 percent of these individuals would consider returning to teaching. If this is so, the actual size

¹⁵ These figures were all estimates based on Cagampang’s work.

of the reserve pool is only 60,000. This number approximates the inactive membership of the STRS which was 53,222 in 1993-94. Finally, Cagampang projected that reserve pool members will return to teaching at the same rate that inactive members of STRS resume teaching.¹⁶ This translates to approximately 4,000 teachers re-entering the elementary and secondary school teaching force from the reserve pool.

Emergency Credentialed Teachers

For each of the last four years, the CTC has issued an average of 6,000 emergency multiple subject credentials. The CTC has also issued an average of approximately 5,000 single subject emergency credentials. As an indication of emergency-credential need in special subject areas, approximately 3,000 special education specialist emergency credentials and 300 bilingual emergency credentials were issued during each of the last four years. No trends in the number of emergency credentials is readily apparent.

Summary of Estimated Availability of Teachers

We project a total supply of 9,000 teachers per year coming from the reserve pool and newly credentialed teachers, with newly credentialed teachers contributing 5,000 teachers per year and the other 4,000 coming from the reserve pool. This estimate though may not persist into the future if enrollment in teacher preparation programs changes or if more accurate estimates of the reserve pool and newly credentialed teachers become available.

¹⁶ Estimated to be 1.7% of the active membership. Multiplying 218,484 by 1.7% gives a figure of approximately 4,000.

Teacher Ethnicity

In 1993, 80 percent of the teachers were white, almost 9 percent were Hispanic, and under 6 percent were black. (Table 12). Despite the increasing trend of racial and ethnic diversity among students, California's teacher credential candidates continue to be predominantly white. Of the pool of new teacher credential candidates in 1991-92, 78 percent were white, 10 percent were Hispanic, 5 percent were Black, and 4 percent were Asian. Further study is required concerning the changes in the demographics of the teaching force, but it is safe to say that there will continue to be a substantial gap in the representation of minorities in teaching.

PROJECTED SHORTFALL

In order to forecast the level of teacher shortfall, we assumed that the number of newly credentialed teachers and the number of teachers returning from the reserve pool will remain constant over the next ten years. This total amounts to 9,000 teachers; 5,000 of which are newly credentialed and the other 4,000 return from the reserve pool. Finally, we used the assumptions for class size and teacher-pupil ratio along with the lower bound and upper bound attrition rates (5.5 percent and 7.67 percent).

With these estimates (Table 13), we predict that the state of California will need the following number of emergency credentials, or otherwise fill the shortfall gap, over the following five and ten year periods to cover the estimated lack of credentialed teachers.

	Projected Shortage: Through 1999	Projected Shortage: Through 2004
Using class size and an attrition rate of 5.5 percent	40,989	86,922

Using class size and an attrition rate of 7.67 percent	61,745	130,557
Using pupil-teacher ratio and an attrition rate of 5.5 percent	55,688	117,432
Using pupil-teacher ratio and an attrition rate of 7.67 percent	80,001	168,545

Moreover, we estimate that the present number of emergency credentials will be 11,000 teachers per year, using CTC emergency credential data. If the shortfall of teachers grows as predicted, the number of emergency credentialed teachers in the California teacher force will similarly have to grow.

CONCLUSION

This paper has laid the groundwork for projecting estimates of the need for teachers in California over the next ten years. The main purpose of this task was to determine whether California will experience a shortage or surplus of teachers over the next ten years. Since we project that teacher shortages will persist into the next century, California must take action to ensure that it can meet its educational demands. Thus, the state must implement strategies that will attract talented individuals into the teaching profession while also maintaining its current base of experienced, skilled teachers.

The barriers to entry into the teaching profession are low. The most significant barrier is the requirement that individuals complete a teacher preparation program before they can become certified. If the state implements strategies that can effectively attract new teachers, they should have success in

welcoming more individuals to the teaching profession. However, because the barriers to entry are low, the state must be concerned with the quality of the teachers that it seeks. Therefore, California must maintain its current base of knowledgeable and skilled teachers. Furthermore, it is essential that the state increase its efforts to entice more intelligent individuals to enroll in teacher preparation programs or otherwise be certified to teach, and it must make an even stronger effort to attract minority individuals and capable bilingual instructors since these areas will continue to have a significant need. It is likely that California will have to intensify its recruitment of out-of-state teachers.

APPENDICES

Table 1

CALIFORNIA K-12 PUBLIC SCHOOL ENROLLMENT
GRADES K-8

COUNTY	Actual Elem. Enrollment 1984	Actual Elem. Enrollment 1994	Actual 10 Year Enrollment Increase	Projected Elem. Enrollment 1999	5 Year Projected Enrollment Increase	Projected Elem. Enrollment 2004	
ALAMEDA	114725	141240	23.11%	151768	7.45%	150607	6.63%
ALPINE	170	175	2.94%	188	7.43%	153	-12.57%
AMADOR	2281	3248	42.39%	3396	4.56%	3720	14.53%
BUTTE	15807	24419	54.48%	25950	6.27%	27707	13.46%
CALAVERAS	2855	4608	61.40%	4924	6.86%	5448	18.23%
COLUSA	1990	2821	41.76%	3022	7.13%	3470	23.01%
CONTRA COSTA	73245	97559	33.20%	108118	10.82%	111657	14.45%
DEL NORTE	2255	3707	64.39%	3916	5.64%	4377	18.07%
EL DORADO	11816	19848	67.98%	21199	6.81%	23046	16.11%
FRESNO	78477	121917	55.35%	140547	15.28%	161707	32.64%
GLENN	3316	4472	34.86%	5000	11.81%	5305	18.63%
HUMBOLDT	12608	15392	22.08%	14060	-8.65%	13641	-11.38%
IMPERIAL	16508	22384	35.59%	25400	13.47%	27762	24.03%
INYO	2124	2404	13.18%	2321	-3.45%	2313	-3.79%
KERN	63897	95704	49.78%	107784	12.62%	122246	27.73%
KINGS	12078	16896	39.89%	18756	11.01%	20827	23.27%
LAKE	4975	7326	47.26%	7569	3.32%	8100	10.57%
LASSEN	2930	3904	33.24%	4092	4.82%	3810	-2.41%
LOS ANGELES	855862	1046831	22.31%	1174559	12.20%	1218520	16.40%
MADERA	11152	16592	48.78%	19855	19.67%	23650	42.54%
MARIN	15543	19372	24.63%	20688	6.79%	19456	0.43%
MARIPOSA	1316	1980	50.46%	2136	7.88%	2283	15.30%
MENDOCINO	9360	10942	16.90%	10688	-2.32%	10594	-3.18%
MERCED	22713	33809	48.85%	37445	10.75%	41914	23.97%
MODOC	1392	1734	24.57%	1569	-9.52%	1543	-11.01%
MONO	877	1367	55.87%	1421	3.95%	1449	6.00%
MONTEREY	37331	45678	22.36%	48492	6.16%	49917	9.28%
NAPA	8948	12900	44.17%	14250	10.47%	14708	14.02%
NEVADA	6227	9130	46.62%	9268	1.51%	9419	3.17%
ORANGE	212353	291538	37.29%	345877	18.64%	358262	22.89%
PLACER	16066	30088	87.28%	37795	25.61%	41989	39.55%
PLUMAS	2389	2637	10.38%	2294	-13.01%	2266	-14.07%
RIVERSIDE	95455	187963	96.91%	233724	24.35%	285729	52.01%
SACRAMENTO	98601	137562	39.51%	151899	10.42%	160659	16.79%
SAN BENITO	4109	6742	64.08%	7963	18.11%	8907	32.11%
SAN BERNARDINO	135353	237666	75.59%	282288	18.78%	326075	37.20%
SAN DIEGO	214376	309305	44.28%	345974	11.86%	380597	23.05%
SAN FRANCISCO	41012	42226	2.96%	41909	-0.75%	37308	-11.65%
SAN JOAQUIN	51285	75709	47.62%	81199	7.25%	86922	14.81%
SAN LUIS OBISPO	16383	24153	47.43%	24852	2.89%	24748	2.46%
SAN MATEO	48860	63216	29.38%	70419	11.39%	68225	7.92%
SANTA BARBARA	30229	42980	42.18%	48721	13.36%	51043	18.76%
SANTA CLARA	143275	168843	17.85%	178785	5.89%	173165	2.56%
SANTA CRUZ	20691	27161	31.27%	28517	4.99%	28823	6.12%
SHASTA	15332	20620	34.49%	21627	4.88%	23336	13.17%
SIERRA	450	606	34.67%	523	-13.70%	404	-33.33%
SISKIYOU	5590	6211	11.11%	5279	-15.01%	4911	-20.93%
SOLANO	32512	47515	46.15%	51602	8.60%	57441	20.89%
SONOMA	34488	48862	41.68%	52423	7.29%	53196	8.87%
STANISLAUS	39693	62562	57.61%	71017	13.51%	80978	29.44%
SUTTER	6895	10501	52.30%	12043	14.68%	13102	24.77%
TEHAMA	5374	7674	42.80%	8276	7.84%	9114	18.76%
TRINITY	1536	1784	16.15%	1650	-7.51%	1601	-10.26%
TULARE	42001	59169	40.88%	68008	14.94%	76508	29.30%
TUOLUMNE	4110	5641	37.25%	5567	-1.31%	6148	8.99%
VENTURA	69342	85882	23.85%	93380	8.73%	95253	10.91%
YOLO	12083	17341	43.52%	18846	8.68%	19933	14.95%
YUBA	7675	10015	30.49%	10239	2.24%	10951	9.35%
CALIFORNIA	2800296	3820531	36.43%	4291077	12.32%	4576943	19.80%

Source: California State Department of Finance

Table 2

**CALIFORNIA K-12 PUBLIC SCHOOL ENROLLMENT
GRADES 9-12**

<u>COUNTY</u>	<u>Actual Secondary Enrollment 1984</u>	<u>Actual Secondary Enrollment 1994</u>	<u>Actual 10 Year Enrollment Increase</u>	<u>Projected Secondary Enrollment 1999</u>	<u>5 Year Projected Enrollment Increase</u>	<u>Projected Secondary Enrollment 2004</u>	<u>10 Year Projected Enrollment Increase</u>
ALAMEDA	55095	51553	-6.43%	55958	8.54%	62524	21.28%
ALPINE	51	0	-100.00%	0	0.00%	0	0.00%
AMADOR	1251	1512	20.86%	1703	12.63%	1842	21.83%
BUTTE	7107	8878	24.92%	9164	3.22%	11469	29.18%
CALAVERAS	1499	2037	35.89%	2259	10.90%	2479	21.70%
COLUSA	893	1251	40.09%	1469	17.43%	1391	11.19%
CONTRA COSTA	37792	37963	0.45%	42657	12.36%	48774	28.48%
DEL NORTE	1024	1431	39.75%	1945	35.92%	2047	43.05%
EL DORADO	5695	7949	39.58%	9697	21.99%	10493	32.00%
FRESNO	31029	42578	37.22%	48842	14.71%	57158	34.24%
GLENN	1325	1654	24.83%	2072	25.27%	2234	35.07%
HUMBOLDT	5128	5949	16.01%	6469	8.74%	5975	0.44%
IMPERIAL	6769	9137	34.98%	9737	6.57%	11645	27.45%
INYO	1063	1038	-2.35%	1084	4.43%	1098	5.78%
KERN	23937	33875	41.52%	37950	12.03%	44079	30.12%
KINGS	4410	5852	32.70%	7026	20.06%	7656	30.83%
LAKE	2125	2713	27.67%	2855	5.23%	3391	24.99%
LASSEN	1370	1534	11.97%	1544	0.65%	1880	22.56%
LOS ANGELES	383656	392848	2.40%	404007	2.84%	484749	23.39%
MADERA	4158	6023	44.85%	6470	7.42%	7721	28.19%
MARIN	9736	7054	-27.55%	8057	14.22%	8963	27.06%
MARIPOSA	706	753	6.66%	916	21.65%	993	31.87%
MENDOCINO	4396	4770	8.51%	5227	9.58%	5364	12.45%
MERCED	9079	12455	37.18%	14554	16.85%	16507	32.53%
MODOC	547	643	17.55%	783	21.77%	743	15.55%
MONO	369	431	16.80%	476	10.44%	525	21.81%
MONTEREY	13393	15298	14.22%	16232	6.11%	17592	15.00%
NAPA	4590	5080	10.68%	6047	19.04%	6702	31.93%
NEVADA	2986	4095	37.14%	4851	18.46%	5101	24.57%
ORANGE	116987	114982	-1.71%	126535	10.05%	150266	30.69%
PLACER	8527	12039	41.19%	17423	44.72%	22003	82.76%
PLUMAS	1102	1203	9.17%	1302	8.23%	1030	-14.38%
RIVERSIDE	39223	67200	71.33%	80018	19.07%	101742	51.40%
SACRAMENTO	44319	49343	11.34%	55144	11.76%	61538	24.71%
SAN BENTITO	1645	2320	41.03%	3131	34.96%	3688	58.97%
SAN BERNARDINO	54279	83694	54.19%	87403	4.43%	114344	36.62%
SAN DIEGO	98836	112615	13.94%	119380	6.01%	144633	28.43%
SAN FRANCISCO	21718	19992	-7.95%	20346	1.77%	21085	5.47%
SAN JOAQUIN	21023	26563	26.35%	29619	11.50%	32823	23.57%
SAN LUIS OBISPO	7651	9342	22.10%	11293	20.88%	11613	24.31%
SAN MATEO	25595	24124	-5.75%	26746	10.87%	31571	30.87%
SANTA BARBARA	14329	14346	0.12%	17387	21.20%	19969	39.20%
SANTA CLARA	72365	63074	-12.84%	68319	8.32%	73469	16.48%
SANTA CRUZ	9675	9890	2.22%	11527	16.55%	12396	25.34%
SHASTA	7378	8602	16.59%	9693	12.68%	10412	21.04%
SIERRA	229	264	15.28%	282	6.82%	258	-2.27%
SISKIYOU	2415	2668	10.48%	2977	11.58%	2606	-2.32%
SOLANO	13775	17897	29.92%	19784	10.54%	22090	23.43%
SONOMA	16076	17446	8.52%	20701	18.66%	22950	31.55%
STANISLAUS	15636	22765	45.99%	26067	14.50%	29657	30.27%
SUTTER	3317	3918	18.12%	4953	26.42%	5844	49.16%
TEHAMA	2303	3151	36.82%	3676	16.66%	3911	24.12%
TRINITY	708	718	1.41%	820	14.21%	897	24.93%
TULARE	15080	20292	34.56%	22750	12.11%	26226	29.24%
TUOLUMNE	2063	2387	15.71%	2666	11.69%	2876	20.49%
VENTURA	32890	34439	4.71%	38635	12.18%	41881	21.61%
YOLO	5515	6832	23.88%	8223	20.36%	8720	27.63%
YUBA	2609	3087	18.32%	3607	16.84%	3831	24.10%
CALIFORNIA	1278447	1421547	11.19%	1550458	9.07%	1815424	27.71%

Source: California State Department of Finance

Table 3

**CALIFORNIA K-12 PUBLIC SCHOOL ENROLLMENT
TOTAL ENROLLMENT**

<u>COUNTY</u>	<u>Actual Total Enrollment 1984</u>	<u>Actual Total Enrollment 1994</u>	<u>Actual 10 Year Enrollment Increase</u>	<u>Projected Total Enrollment 1999</u>	<u>5 Year Projected Enrollment Increase</u>	<u>Projected Total Enrollment 2004</u>	<u>10 Year Projected Enrollment Increase</u>
ALAMEDA	169820	192793	13.53%	207726	7.75%	213131	10.55%
ALPINE	221	175	-20.81%	188	0.00%	153	0.00%
AMADOR	3532	4760	34.77%	5099	7.12%	5562	16.85%
BUTTE	22914	33297	45.31%	35114	5.46%	39176	17.66%
CALAVERAS	4354	6645	52.62%	7183	8.10%	7927	19.29%
COLUSA	2883	4072	41.24%	4491	10.29%	4861	19.38%
CONTRA COSTA	111037	135522	22.05%	150775	11.25%	160431	18.38%
DEL NORTE	3279	5138	56.69%	5861	14.07%	6424	25.03%
EL DORADO	17511	27797	58.74%	30896	11.15%	33539	20.66%
FRESNO	109506	164495	50.22%	189389	15.13%	218865	33.05%
GLENN	4641	6126	32.00%	7072	15.44%	7539	23.07%
HUMBOLDT	17736	21341	20.33%	20529	-3.80%	19616	-8.08%
IMPERIAL	23277	31521	35.42%	35137	11.47%	39407	25.02%
INYO	3187	3442	8.00%	3405	-1.07%	3411	-0.90%
KERN	87834	129579	47.53%	145734	12.47%	166325	28.36%
KINGS	16488	22748	37.97%	25782	13.34%	28483	25.21%
LAKE	7100	10039	41.39%	10424	3.84%	11491	14.46%
LASSEN	4300	5438	26.47%	5636	3.64%	5690	4.63%
LOS ANGELES	1239518	1439679	16.15%	1578566	9.65%	1703269	18.31%
MADERA	15310	22615	47.71%	26325	16.41%	31371	38.72%
MARIN	25279	26426	4.54%	28745	8.78%	28419	7.54%
MARIPOSA	2022	2733	35.16%	3052	11.67%	3276	19.87%
MENDOCINO	13756	15712	14.22%	15915	1.29%	15958	1.57%
MERCED	31792	46264	45.52%	51999	12.40%	58421	26.28%
MODOC	1939	2377	22.59%	2352	-1.05%	2286	-3.83%
MONO	1246	1798	44.30%	1897	5.51%	1974	9.79%
MONTEREY	50724	60976	20.21%	64724	6.15%	67509	10.71%
NAPA	13538	17980	32.81%	20297	12.89%	21410	19.08%
NEVADA	9213	13225	43.55%	14119	6.76%	14520	9.79%
ORANGE	329340	406520	23.43%	472412	16.21%	508528	25.09%
PLACER	24593	42127	71.30%	55218	31.08%	63992	51.90%
PLUMAS	3491	3840	10.00%	3596	-6.35%	3296	-14.17%
RIVERSIDE	134678	255163	89.46%	313742	22.96%	387471	51.85%
SACRAMENTO	142920	186905	30.78%	207043	10.77%	222197	18.88%
SAN BENITO	5754	9062	57.49%	11094	22.42%	12595	38.99%
SAN BERNARDINO	189632	321360	69.47%	369691	15.04%	440419	37.05%
SAN DIEGO	313212	421920	34.71%	465354	10.29%	525230	24.49%
SAN FRANCISCO	62730	62218	-0.82%	62255	0.06%	58393	-6.15%
SAN JOAQUIN	72308	102272	41.44%	110818	8.36%	119745	17.08%
SAN LUIS OBISPO	24034	33495	39.37%	36145	7.91%	36361	8.56%
SAN MATEO	74455	87340	17.31%	97165	11.25%	99796	14.26%
SANTA BARBARA	44558	57326	28.65%	66108	15.32%	71012	23.87%
SANTA CLARA	215640	231917	7.55%	247104	6.55%	246634	6.35%
SANTA CRUZ	30366	37051	22.01%	40044	8.08%	41219	11.25%
SHASTA	22710	29222	28.67%	31320	7.18%	33748	15.49%
SIERRA	679	870	28.13%	805	-7.47%	662	-23.91%
SISKIYOU	8005	8879	10.92%	8256	-7.02%	7517	-15.34%
SOLANO	46287	65412	41.32%	71386	9.13%	79531	21.58%
SONOMA	50564	66308	31.14%	73124	10.28%	76146	14.84%
STANISLAUS	55329	85327	54.22%	97084	13.78%	110635	29.66%
SUTTER	10212	14419	41.20%	16996	17.87%	18946	31.40%
TEHAMA	7677	10825	41.01%	11952	10.41%	13025	20.32%
TRINITY	2244	2502	11.50%	2470	-1.28%	2498	-0.16%
TULARE	57081	79461	39.21%	90758	14.22%	102734	29.29%
TUOLUMNE	6173	8028	30.05%	8233	2.55%	9024	12.41%
VENTURA	102232	120321	17.69%	132015	9.72%	137134	13.97%
YOLO	17598	24173	37.36%	27069	11.98%	28653	18.53%
YUBA	10284	13102	27.40%	13846	5.68%	14782	12.82%
CALIFORNIA	4078743	5242078	28.52%	5841535	11.44%	6392367	21.94%

Source: California State Department of Finance

Table 3A

CALIFORNIA PUBLIC SCHOOL ENROLLMENT PROJECTIONS (1994 to 2004)

<u>Year</u>	<u>Elementary Enrollment</u>	<u>Enrollment Increase</u>	<u>Percent Increase</u>	<u>Secondary Enrollment</u>	<u>Enrollment Increase</u>	<u>Percent Increase</u>	<u>Total Enrollment</u>	<u>Enrollment Increase</u>	<u>Percent Increase</u>
1994	3820531			1421547			5242078		
1995	3918313	97782	2.56%	1444864	23317	1.64%	5363177	121099	2.31%
1996	4021001	102688	2.62%	1474074	29210	2.02%	5495075	131898	2.46%
1997	4122121	101120	2.51%	1501301	27227	1.85%	5623422	128347	2.34%
1998	4214085	91964	2.23%	1523789	22488	1.50%	5737874	114452	2.04%
1999	4291077	76992	1.83%	1550458	26669	1.75%	5841535	103661	1.81%
2000	4370123	79046	1.84%	1574944	24486	1.58%	5945067	103532	1.77%
2001	4449969	79846	1.83%	1602273	27329	1.74%	6052242	107175	1.80%
2002	4517921	67952	1.53%	1642310	40037	2.50%	6160231	107989	1.78%
2003	4565002	47081	1.04%	1706879	64569	3.93%	6271881	111650	1.81%
2004	4576943	11941	0.26%	1815424	108545	6.36%	6392367	120486	1.92%
1994 to 1999		470546	12.32%		128911	9.07%		599457	11.44%
1994 to 2004		756412	19.80%		393877	27.71%		1150289	21.94%

Source: California State Department of Finance

Table 4

Historical Limited English Proficient Enrollment, 1988-1994

<u>Year</u>	<u>Spanish</u>	<u>Vietnamese</u>	<u>All Other Languages</u>	<u>State Total</u>
1988	475001	32055	145383	652439
1989	553498	32454	156607	742559
1990	655097	34934	171500	861531
1991	755359	40477	190626	986462
1992	828036	45155	205514	1078705
1993	925778	47282	220207	1193267
1994	943559	49788	221871	1215218

Table 5

California Class Size and Pupil-Teacher Ratios

Average Class Size

	<u>1988-89</u>	<u>1990-91</u>	<u>1992-93</u>	<u>1993-94</u>	<u>Average</u>
Elementary Schools	27.3	28.3	29.4	29.4	28.6
Secondary Schools	27.7	28.8	29.8	29.8	29

Average Pupil-Teacher Ratio

	<u>1988-89</u>	<u>1990-91</u>	<u>1992-93</u>	<u>1993-94</u>	<u>Average</u>
Elementary Schools	24.4	24.4	25.1	25.1	24.7
Secondary Schools	23.5	23.4	24.6	24.5	24

Source: California Fact Book, July 1994.

Table 5A

TEACHER NEED PROJECTION BY COUNTY
Current Pupil-Teacher Ratio

COUNTY	Total FTE's	Actual Total	Projected Total	Projected Total	Current Pupil-Teacher Ratio	Number of	Increase over	Number of	Increase over
		Enrollment 1994	Enrollment 1999	Enrollment 2004		FTEs Needed in 1999	Current Teacher Needs (1994-1999)	FTEs needed in 2004	Current Teacher Needs (1994-2004)
ALAMEDA	8276	192793	207726	213131	23	8917	641	9149	873
ALPINE	13	175	188	153	13	14	1	11	-2
AMADOR	192	4760	5099	5562	25	206	14	224	32
BUTTE	1476	33297	35114	39176	23	1557	81	1737	261
CALAVERAS	374	6645	7183	7927	18	404	30	446	72
COLUSA	208	4072	4491	4861	20	229	21	248	40
CONTRA COSTA	5911	135522	150775	160431	23	6576	665	6997	1086
DEL NORTE	224	5138	5861	6424	23	256	32	280	56
EL DORADO	1203	27797	30896	33539	23	1337	134	1452	249
FRESNO	7083	164495	189389	218865	23	8155	1072	9424	2341
GLENN	291	6126	7072	7539	21	336	45	358	67
HUMBOLDT	1054	21341	20529	19616	20	1014	-40	969	-85
IMPERIAL	1319	31521	35137	39407	24	1470	151	1649	330
INYO	174	3442	3405	3411	20	172	-2	172	-2
KERN	5492	129579	145734	166325	24	6177	685	7049	1557
KINGS	968	22748	25782	28483	24	1097	129	1212	244
LAKE	464	10039	10424	11491	22	482	18	531	67
LASSEN	270	5438	5636	5690	20	280	10	283	13
LOS ANGELES	58055	1439679	1578566	1703269	25	63656	5601	68684	10629
MADERA	961	22615	26325	31371	24	1119	158	1333	372
MARIN	1289	26426	28745	28419	21	1402	113	1386	97
MARIPOSA	123	2733	3052	3276	22	137	14	147	24
MENDOCINO	810	15712	15915	15958	19	820	10	823	13
MERCED	1966	46264	51999	58421	24	2210	244	2483	517
MODOC	133	2377	2352	2286	18	132	-1	128	-5
MONO	92	1798	1897	1974	20	97	5	101	9
MONTEREY	2711	60976	64724	67509	22	2878	167	3001	290
NAPA	785	17980	20297	21410	23	886	101	935	150
NEVADA	572	13225	14119	14520	23	611	39	628	56
ORANGE	15831	406520	472412	508528	26	18397	2566	19803	3972
PLACER	1651	42127	55218	63992	26	2164	513	2508	857
PLUMAS	174	3840	3596	3296	22	163	-11	149	-25
RIVERSIDE	9934	255163	313742	387471	26	12215	2281	15085	5151
SACRAMENTO	7893	186905	207043	222197	24	8743	850	9383	1490
SAN BENITO	368	9062	11094	12595	25	451	83	511	143
SAN BERNARDINO	13023	321360	369691	440419	25	14982	1959	17848	4825
SAN DIEGO	17477	421920	465354	525230	24	19276	1799	21756	4279
SAN FRANCISCO	3071	62218	62255	58393	20	3073	2	2882	-189
SAN JOAQUIN	4442	102272	110818	119745	23	4813	371	5201	759
SAN LUIS OBISPO	1473	33495	36145	36361	23	1590	117	1599	126
SAN MATEO	3950	87340	97165	99796	22	4394	444	4513	563
SANTA BARBARA	2510	57326	66108	71012	23	2895	385	3109	599
SANTA CLARA	10031	231917	247104	246634	23	10688	657	10668	637
SANTA CRUZ	1592	37051	40044	41219	23	1721	129	1771	179
SHASTA	1284	29222	31320	33748	23	1376	92	1483	199
SIERRA	54	870	805	662	16	50	-4	41	-13
SISKIYOU	468	8879	8256	7517	19	435	-33	396	-72
SOLANO	2816	65412	71386	79531	23	3073	257	3424	608
SONOMA	2861	66308	73124	76146	23	3155	294	3285	424
STANISLAUS	3674	85327	97084	110635	23	4180	506	4764	1090
SUTTER	654	14419	16996	18946	22	771	117	859	205
TEHAMA	486	10825	11952	13025	22	537	51	585	99
TRINITY	145	2502	2470	2498	17	143	-2	145	0
TULARE	3409	79461	90758	102734	23	3894	485	4407	998
TUOLUMNE	350	8028	8233	9024	23	359	9	393	43
VENTURA	4713	120321	132015	137134	26	5171	458	5372	659
YOLO	1079	24173	27069	28653	22	1208	129	1279	200
YUBA	583	13102	13846	14782	22	616	33	658	75
CALIFORNIA	218485	5242078	5841535	6392367	24	243470	24985	266428	47943

Source: California State Department of Finance

Table 6

CALIFORNIA PUBLIC SCHOOL TEACHER NEED DUE TO ATTRITION

Teacher Demand Due to Attrition
Elementary Schools

<u>Year</u>	<u>Total Teachers Needed (Class Size)</u>	<u>Total Teachers Needed (P-T Ratio)</u>	<u>Lower Bound Attrition = National Rate</u>	<u>FTEs Needed to Replace Attrition (Class Size)</u>	<u>FTEs Needed to Replace Attrition (P-T Ratio)</u>	<u>Upper Bound Attrition = State Rate</u>	<u>FTEs Needed to Replace Attrition (Class Size)</u>	<u>FTEs Needed to Replace Attrition (P-T Ratio)</u>
1994	133585	154677	5.50%	7347	8507	7.67%	10246	11864
1995	137004	158636	5.50%	7535	8725	7.67%	10508	12167
1996	140594	162794	5.50%	7733	8954	7.67%	10784	12486
1997	144130	166887	5.50%	7927	9179	7.67%	11055	12800
1998	147346	170611	5.50%	8104	9384	7.67%	11301	13086
1999	150038	173728	5.50%	8252	9555	7.67%	11508	13325
2000	152802	176928	5.50%	8404	9731	7.67%	11720	13570
2001	155593	180161	5.50%	8558	9909	7.67%	11934	13818
2002	157969	182912	5.50%	8688	10060	7.67%	12116	14029
2003	159615	184818	5.50%	8779	10165	7.67%	12243	14176
2004	160033	185301	5.50%	8802	10192	7.67%	12275	14213
Projected Need from 1994 to 1999				46898	54303		65402	75728
Projected Need from 1994 to 2004				90129	104360		125689	145535

Teacher Demand Due to Attrition
Secondary Schools

<u>Year</u>	<u>Total Teachers Needed (Class Size)</u>	<u>Total Teachers Needed (P-T Ratio)</u>	<u>Lower Bound Attrition = National Rate</u>	<u>FTEs Needed to Replace Attrition (Class Size)</u>	<u>FTEs Needed to Replace Attrition (P-T Ratio)</u>	<u>Upper Bound Attrition = State Rate</u>	<u>FTEs Needed to Replace Attrition (Class Size)</u>	<u>FTEs Needed to Replace Attrition (P-T Ratio)</u>
1994	48977	59231	5.50%	2694	3258	7.67%	3757	4543
1995	49780	60203	5.50%	2738	3311	7.67%	3818	4618
1996	50786	61420	5.50%	2793	3378	7.67%	3895	4711
1997	51724	62554	5.50%	2845	3440	7.67%	3967	4798
1998	52499	63491	5.50%	2887	3492	7.67%	4027	4870
1999	53418	64602	5.50%	2938	3553	7.67%	4097	4955
2000	54262	65623	5.50%	2984	3609	7.67%	4162	5033
2001	55203	66761	5.50%	3036	3672	7.67%	4234	5121
2002	56583	68430	5.50%	3112	3764	7.67%	4340	5249
2003	58807	71120	5.50%	3234	3912	7.67%	4511	5455
2004	62547	75643	5.50%	3440	4160	7.67%	4797	5802
Projected Need from 1994 to 1999				16895	20433		23561	28494
Projected Need from 1994 to 2004				32702	39549		45605	55153

Table 7

**TEACHER DEMAND DUE TO TEACHER RETIREMENT
Elementary & Secondary Schools**

Elementary Schools						Secondary Schools				
Year	Total Teachers Needed (Class Size)	Total Teachers Needed (P-T Ratio)	Retirement Rate	FTEs Needed to Replace Retirement (Class Size)	FTEs Needed to Replace Retirement (P-T Ratio)	Total Teachers Needed (Class Size)	Total Teachers Needed (P-T Ratio)	Retirement Rate	FTEs Needed to Replace Retirement (Class Size)	FTEs Needed to Replace Retirement (P-T Ratio)
1994	133585	154677	1.30%			48977	59231	1.30%		
1995	137004	158636	1.30%	1737	2011	49780	60203	1.30%	637	770
1996	140594	162794	1.30%	1781	2062	50786	61420	1.30%	647	783
1997	144130	166887	1.30%	1828	2116	51724	62554	1.30%	660	798
1998	147346	170611	1.30%	1874	2170	52499	63491	1.30%	672	813
1999	150038	173728	1.30%	1915	2218	53418	64602	1.30%	682	825
2000	152802	176928	1.30%	1950	2258	54262	65623	1.30%	694	840
2001	155593	180161	1.30%	1986	2300	55203	66761	1.30%	705	853
2002	157969	182912	1.30%	2023	2342	56583	68430	1.30%	718	868
2003	159615	184818	1.30%	2054	2378	58807	71120	1.30%	736	890
2004	160033	185301	1.30%	2075	2403	62547	75643	1.30%	764	925
Projected Need from 1994 to 1999				9135	10577				3299	3990
Projected Need from 1994 to 2004				19223	22258				6917	8365

STRS Retirement Rates (based on all STRS employees)

Year	Number of STRS Members	Number of Retirees	Percent Retired
1984	253687	3807	1.50%
1985	257663	3179	1.23%
1986	263569	2802	1.06%
1987	271764	4022	1.48%
1988	278324	3848	1.38%
1989	284913	3322	1.17%
1990	299860	4545	1.52%
1991	306791	3953	1.29%
1992	312579	3799	1.22%
1993	313617	3714	1.18%

Average Rate 1.30%

SOURCE: State Teachers' Retirement System

Table 8

TOTAL FTEs NEEDED IN CALIFORNIA ELEMENTARY SCHOOLS

Teacher Need Based on Class Size

<u>Year</u>	<u>Total FTEs Needed due to Enrollment</u>	<u>FTEs Needed to Replace Retirement</u>	<u>FTEs Needed to Replace Attrition (Lower Bound)</u>	<u>FTEs Needed to Replace Attrition (Upper Bound)</u>	<u>FTEs Needed for Enrollment Growth</u>	<u>Total FTEs Needed Due to Enrollment Growth, Retirement, & Attrition (Lower Bound)</u>	<u>Total FTEs Needed Due to Enrollment Growth, Retirement, & Attrition (Upper Bound)</u>
1994	133585						
1995	137004	1737	7347	10246	3419	12503	15402
1996	140594	1781	7535	10508	3590	12907	15880
1997	144130	1828	7733	10784	3536	13096	16147
1998	147346	1874	7927	11055	3216	13016	16144
1999	150038	1915	8104	11301	2692	12712	15909
2000	152802	1950	8252	11508	2764	12966	16222
2001	155593	1986	8404	11720	2792	13182	16498
2002	157969	2023	8558	11934	2376	12956	16333
2003	159615	2054	8688	12116	1646	12388	15816
2004	160033	2075	8779	12243	418	11271	14735

Teacher Need Based on Pupil-Teacher Ratio

<u>Year</u>	<u>Total FTEs Needed due to Enrollment</u>	<u>FTEs Needed to Replace Retirement</u>	<u>FTEs Needed to Replace Attrition (Lower Bound)</u>	<u>FTEs Needed to Replace Attrition (Upper Bound)</u>	<u>FTEs Needed for Enrollment Growth</u>	<u>Total FTEs Needed Due to Enrollment Growth, Retirement, & Attrition (Lower Bound)</u>	<u>Total FTEs Needed Due to Enrollment Growth, Retirement, & Attrition (Upper Bound)</u>
1995	158636	2011	8507	11864	3959	14477	17833
1996	162794	2062	8725	12167	4157	14945	18387
1997	166887	2116	8954	12486	4094	15164	18697
1998	170611	2170	9179	12800	3723	15072	18693
1999	173728	2218	9384	13086	3117	14719	18421
2000	176928	2258	9555	13325	3200	15014	18784
2001	180161	2300	9731	13570	3233	15264	19103
2002	182912	2342	9909	13818	2751	15002	18912
2003	184818	2378	10060	14029	1906	14344	18313
2004	185301	2403	10165	14176	483	13051	17062

Table 9

TOTAL FTEs NEEDED IN CALIFORNIA SECONDARY SCHOOLS

Teacher Need Based on Class Size

<u>Year</u>	<u>Total FTEs Needed due to Enrollment</u>	<u>FTEs Needed to Replace Retirement</u>	<u>FTEs Needed to Replace Attrition (Lower Bound)</u>	<u>FTEs Needed to Replace Attrition (Upper Bound)</u>	<u>FTEs Needed for Enrollment Growth</u>	<u>Total FTEs Needed Due to Enrollment Growth, Retirement, & Attrition (Lower Bound)</u>	<u>Total FTEs Needed Due to Enrollment Growth, Retirement, & Attrition (Upper Bound)</u>
1995	49780	647	2694	3757	803	4144	5207
1996	50786	660	2738	3818	1006	4404	5485
1997	51724	672	2793	3895	938	4404	5506
1998	52499	682	2845	3967	775	4302	5425
1999	53418	694	2887	4027	919	4501	5640
2000	54262	705	2938	4097	844	4487	5646
2001	55203	718	2984	4162	942	4644	5821
2002	56583	736	3036	4234	1379	5151	6349
2003	58807	764	3112	4340	2225	6101	7329
2004	62547	813	3234	4511	3740	7787	9063

Teacher Need Based on Pupil Teacher Ratio

<u>Year</u>	<u>Total FTEs Needed due to Enrollment</u>	<u>FTEs Needed to Replace Retirement</u>	<u>FTEs Needed to Replace Attrition (Lower Bound)</u>	<u>FTEs Needed to Replace Attrition (Upper Bound)</u>	<u>FTEs Needed for Enrollment Growth</u>	<u>Total FTEs Needed Due to Enrollment Growth, Retirement, & Attrition (Lower Bound)</u>	<u>Total FTEs Needed Due to Enrollment Growth, Retirement, & Attrition (Upper Bound)</u>
1995	60203	783	3258	4543	972	5012	6297
1996	61420	798	3311	4618	1217	5327	6633
1997	62554	813	3378	4711	1134	5326	6659
1998	63491	825	3440	4798	937	5203	6560
1999	64602	840	3492	4870	1111	5443	6821
2000	65623	853	3553	4955	1020	5426	6828
2001	66761	868	3609	5033	1139	5616	7040
2002	68430	890	3672	5121	1668	6230	7678
2003	71120	925	3764	5249	2690	7379	8863
2004	75643	983	3912	5455	4523	9418	10961

Table 10

TOTAL FTEs NEEDED IN CALIFORNIA SCHOOLS

Teacher Need Based on Class Size

<u>Year</u>	<u>Total FTEs Needed (Elementary/Lower Bound)</u>	<u>Total FTEs Needed (Secondary/Lower Bound)</u>	<u>Total FTEs Needed (Lower Bound)</u>	<u>Total FTEs Needed (Elementary/Upper Bound)</u>	<u>Total FTEs Needed (Secondary/Upper Bound)</u>	<u>Total FTEs Needed (Upper Bound)</u>
1994						
1995	12503	4144	16647	15402	5207	20609
1996	12907	4404	17311	15880	5485	21365
1997	13096	4404	17500	16147	5506	21653
1998	13016	4302	17318	16144	5425	21569
1999	12712	4501	17213	15909	5640	21549
2000	12966	4487	17453	16222	5646	21868
2001	13182	4644	17826	16498	5821	22319
2002	12956	5151	18107	16333	6349	22682
2003	12388	6101	18489	15816	7329	23145
2004	11271	7787	19058	14735	9063	23798
Five-Year Cumulative Need			85989			106745
Ten-Year Cumulative Need			176922			220557

Teacher Need Based on Pupil-Teacher Ratio

<u>Year</u>	<u>Total FTEs Needed (Elementary/Lower Bound)</u>	<u>Total FTEs Needed (Secondary/Lower Bound)</u>	<u>Total FTEs Needed (Lower Bound)</u>	<u>Total FTEs Needed (Elementary/Upper Bound)</u>	<u>Total FTEs Needed (Secondary/Upper Bound)</u>	<u>Total FTEs Needed (Upper Bound)</u>
1995	14477	5012	19489	17833	6297	24130
1996	14945	5327	20272	18387	6633	25020
1997	15164	5326	20490	18697	6659	25356
1998	15072	5203	20275	18693	6560	25253
1999	14719	5443	20162	18421	6821	25242
2000	15014	5426	20440	18784	6828	25612
2001	15264	5616	20880	19103	7040	26143
2002	15002	6230	21232	18912	7678	26590
2003	14344	7379	21723	18313	8863	27176
2004	13051	9418	22469	17062	10961	28023
Five-Year Cumulative Need			100688			125001
Ten-Year Cumulative Need			207432			258545

Table 11

Credentials Issued By CTC, 1993

(Issued to Applicants who had not held credential previously)

Credential Type

	<u>1990-91</u>	<u>1991-92</u>	<u>1992-93</u>	<u>1993-94</u>	<u>Total</u>	<u>Average Per Year</u>
Multiple Subject	6591	7274	5365	5663	24893	6223
Single Subject	4393	4283	2969	3132	14777	3694
Limited English Proficient	3259	5172	5934	8264	22629	5657
Special Education Specialist Instruction	3863	5013	4893	5103	18872	4718

Emergency Credential Type

	<u>1990-91</u>	<u>1991-92</u>	<u>1992-93</u>	<u>1993-94</u>	<u>Total</u>	<u>Average Per Year</u>
Multiple Subject - Limited Assignment	55	59	33	19	166	42
Multiple Subject - Long Term	5624	6325	4768	5245	21962	5491
Multiple Subject - Bilingual	220	304	288	298	1110	278
Single Subject - Limited Assignment	701	1051	808	881	3441	860
Single Subject - Long Term	3998	4862	3616	4510	16986	4247
Single Subject - Bilingual	8	19	15	15	57	14
Special Education Specialist	2783	3093	2879	2802	11557	2889

Source: California Commission on Teacher Credentialing

Table 12

Teachers, By Ethnic Group, 1993-94

<u>Ethnic Group</u>	<u>Number of Teachers</u>	<u>Percent</u>
American Indian or Alaskan	1686	0.7
Asian	7925	3.5
Pacific Islander	348	0.2
Filipino	1614	0.7
Hispanic	19431	8.7
Black	11924	5.3
White	179767	80.3
Not reported	1237	0.6
Total	223932	100

Table 13

TEACHER SHORTAGE: EMERGENCY CREDENTIALS NEEDED**Emergency Credentials Needed Based on Class Size**

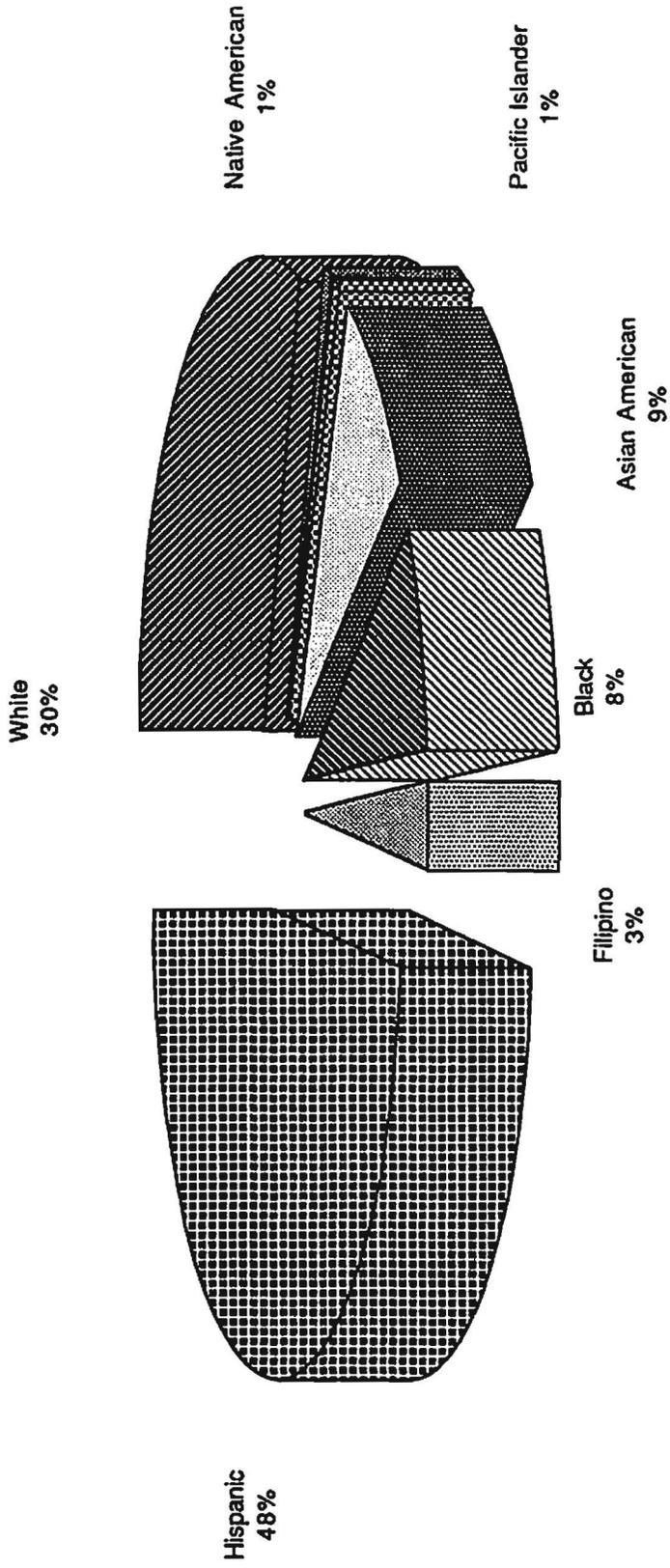
<u>Year</u>	<u>Total FTEs Needed (Lower Bound)</u>	<u>Constant Supply (w/o Emergency Credentials)</u>	<u>Emergency Credentials Needed to Meet Shortfall</u>	<u>Total Emergency Credentials Needed (including present emergency credentials issued)</u>	<u>Total FTEs Needed (Upper Bound)</u>	<u>Constant Supply (w/o Emergency Credentials)</u>	<u>Emergency Credentials Needed to Meet Shortfall</u>	<u>Total Emergency Credentials Needed (including present emergency credentials issued)</u>
1994								
1995	16647	9000	7647	18647	20609	9000	11609	22609
1996	17311	9000	8311	19311	21365	9000	12365	23365
1997	17500	9000	8500	19500	21653	9000	12653	23653
1998	17318	9000	8318	19318	21569	9000	12569	23569
1999	17213	9000	8213	19213	21549	9000	12549	23549
2000	17453	9000	8453	19453	21868	9000	12868	23868
2001	17826	9000	8826	19826	22319	9000	13319	24319
2002	18107	9000	9107	20107	22682	9000	13682	24682
2003	18489	9000	9489	20489	23145	9000	14145	25145
2004	19058	9000	10058	21058	23798	9000	14798	25798
Total Projected Need in 1999			40989				61745	
Total Projected Need in 2004			86922				130557	

Teacher Need Based on Pupil-Teacher Ratio

<u>Year</u>	<u>Total FTEs Needed (Lower Bound)</u>	<u>Constant Supply (w/o Emergency Credentials)</u>	<u>Emergency Credentials Needed to Meet Shortfall</u>	<u>Total Emergency Credentials Needed (including present emergency credentials issued)</u>	<u>Total FTEs Needed (Upper Bound)</u>	<u>Constant Supply (w/o Emergency Credentials)</u>	<u>Emergency Credentials Needed to Meet Shortfall</u>	<u>Total Emergency Credentials Needed (including present emergency credentials issued)</u>
1995	19489	9000	10489	21489	24130	9000	15130	26130
1996	20272	9000	11272	22272	25020	9000	16020	27020
1997	20490	9000	11490	22490	25356	9000	16356	27356
1998	20275	9000	11275	22275	25253	9000	16253	27253
1999	20162	9000	11162	22162	25242	9000	16242	27242
2000	20440	9000	11440	22440	25612	9000	16612	27612
2001	20880	9000	11880	22880	26143	9000	17143	28143
2002	21232	9000	12232	23232	26590	9000	17590	28590
2003	21723	9000	12723	23723	27176	9000	18176	29176
2004	22469	9000	13469	24469	28023	9000	19023	30023
Total Projected Need in 1999			55688				80001	
Total Projected Need in 2004			117432				168545	

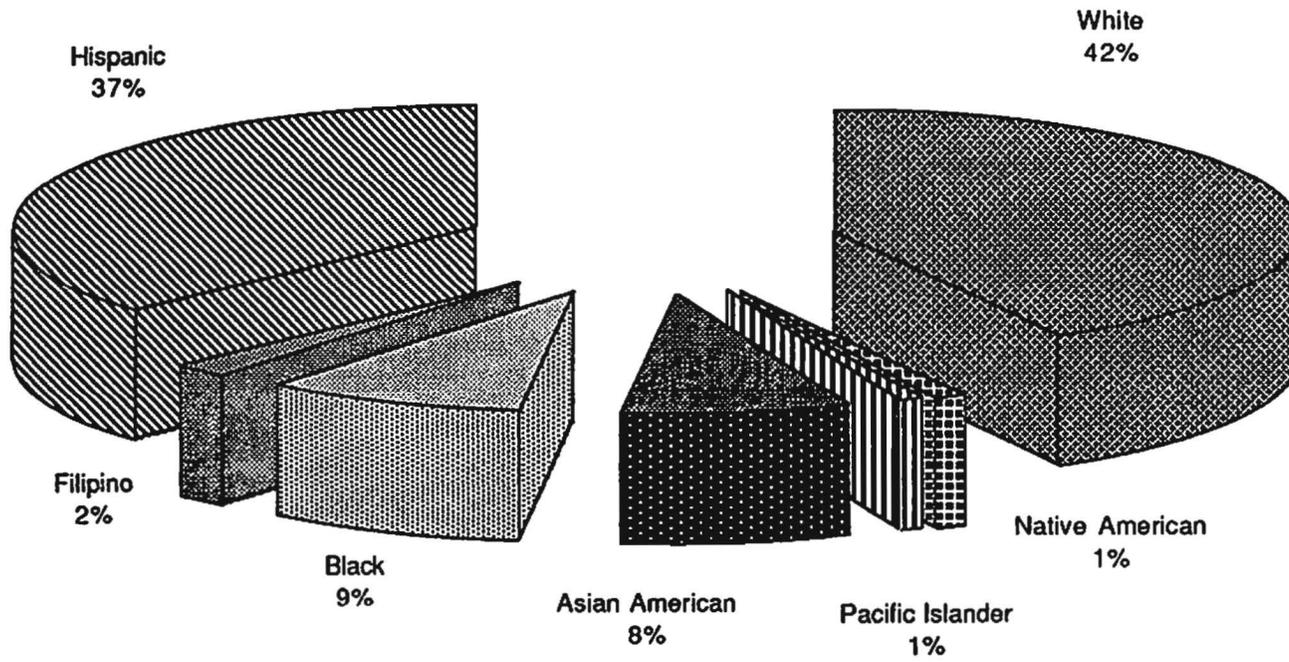
GRAPH 1

Enrollment Projection by Ethnicity: 2003



GRAPH 2

Enrollment by Ethnicity: 1993



SOURCES

SOURCES

BIBLIOGRAPHY

Association of Teacher Educators, Restructuring the Education of Teachers. (1991).

Boe, Erling E. and Gilford, Dorothy M., Editors, Teacher Supply, Demand, and Quality: Policy Issues, Models, and Data Bases, National Research Council, National Academy Press. (1992).

Cagampang, Helen H. et al., Teacher Supply and Demand in California: Is the Reserve Pool a Realistic Source of Supply? PACE Policy Paper No. PP86-8-4 (August 1986).

California Department of Finance, 1994 California Statistical Abstract. (1994).

California Department of Education, Fact Book, 1993-94. (1994).

California Department of Education, Fact Book, 1994-95. (1995).

California State Association of Counties, 1991-92 California County Fact Book. (1992).

California State Teachers' Retirement System, 1988-91 Experience Study. (1993).

Commission on Teacher Credentialing, State of California, Leadership, Responsibility, and Innovation in the Education Decade. Seventeenth Report of the Commission on Teacher Credentialing, 1989-1991. (July 1991).

Commission on Teacher Credentialing and California Department of Education, Success for Beginning Teachers: The California New Teacher Project, 1988-92. (March 1992).

Commission on Teacher Credentialing and California Department of Education, Report on Implementation of the Beginning Teacher support and Assessment Program, 1992-94. (December 1994).

- Hammer, Charles H. and Gerald, Elizabeth, Aspects of Teacher Supply and Demand in Public School Districts and Private Schools: 1987-88. NCES ED TABS, U.S. Department of Education (August 1991).
- Huddy, Sanford L., Institutional Data: 1990-1991. Commission on Teacher Credentialing, State of California. (March 1993).
- Kennedy, Mary M., *The Problem of Improving Teacher Quality While Balancing Supply and Demand*, in Teacher Supply, Demand, and Quality: Policy Issues, Models, and Data Bases, National Research Council, National Academy Press (1992).
- The National Association of Secondary School Principals, Teacher Incentives: A Tool for Effective Management. (1984).
- Policy Analysis for California Education (PACE), Conditions of Education in California, 1992-93. (1993).
- Policy Analysis for California Education (PACE), Conditions of Education in California, 1993-94. (1994).
- Policy Analysis for California Education (PACE), Conditions of Education in California, 1994-95. (1995).
- Public Agenda, First Things First: What Americans Expect From Their Public Schools. (1994).
- Rollefson, Mary R., Teacher Supply in the United States: Sources of Newly Hired Teachers in Public and Private Schools, NCES Statistical Analysis Report, U.S. Department of Education (July 1993).
- Schlechty, Phillip C. and Vance, Victor S., "Recruitment, Selection and Retention: The Shape of the Teaching Force." Elementary School Journal, 83 (March 1983).
- ___, State Teachers' Retirement System, Annual Report: 1994. (1994).
- ___, State Teachers' Retirement System, Annual Report: 1993. (1993).
- ___, Teacher Supply and Demand, National Education Association. (1986).

U.S. Department of Education, Digest of Educational Statistics, 1994. (1994).

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