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Attorneys for Defendant State of California

**SUPERIOR COURT OF THE STATE OF CALIFORNIA  
CITY AND COUNTY OF SAN FRANCISCO**

ELIEZER WILLIAMS, et al.,            ) Case No. 312 236  
  ) )  
  ) Plaintiffs,        ) Date Action Filed: May 17, 2000

vs.

STATE OF CALIFORNIA, DELAINE )  
EASTIN, State Superintendent )  
Of Public Instruction, STATE )  
DEPARTMENT OF EDUCATION, STATE )  
BOARD OF EDUCATION,            )  
  )  
  ) Defendants.        )  
  )

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STATE OF CALIFORNIA            )  
  )  
  ) Cross-Complainant, )  
  )  
  ) vs.                 )  
SAN FRANCISCO UNIFIED SCHOOL )  
DISTRICT, et al.,                )  
  )  
  ) Cross-Defendants.    )  
  )

**EXPERT WITNESS DECLARATION RE MICHAEL J. PODGURSKY, Ph.D.**

1 I, Paul B. Salvaty, declare as follows:

2  
3 1. I am an attorney with the law firm of O'Melveny & Myers  
4 LLP, counsel of record herein for defendant State of California  
5 ("the State").

6  
7 2. The State has provided a list of persons whose expert  
8 opinion testimony the State intends to offer at trial of this  
9 action, either orally or by deposition testimony. The list  
10 includes Professor Michael Podgursky, to whom this declaration  
11 refers.

12  
13 3. Professor Podgursky has agreed to testify at trial.

14  
15 4. Professor Podgursky will be sufficiently familiar with  
16 the pending action to submit to a meaningful oral deposition  
17 concerning the specific testimony, including any opinions and  
18 their bases, that Professor Podgursky is expected to give at  
19 trial.

20  
21 5. Professor Podgursky's fee for providing deposition  
22 testimony, consulting with the State, conducting research and  
23 other activities undertaken in preparation of the attached report  
24 is \$150 per hour.

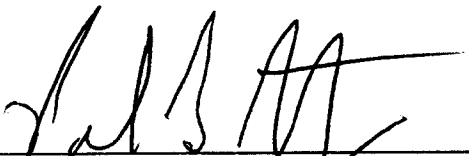
25  
26 6. Pursuant to Section 2034(f)(2)(A) of the California  
27 Code of Civil Procedure, attached hereto as Exhibit A and  
28

1 incorporated herein by reference is a curriculum vitae providing  
2 Professor Podgursky's professional qualifications.

3  
4 7. Attached hereto as Exhibit B and incorporated herein by  
5 reference is Professor Podgursky's expert report. Pursuant to  
6 Section 2034(f)(2)(B) of the California Code of Civil Procedure,  
7 the following is a brief narrative statement of the general  
8 substance of the testimony that Professor Podgursky is expected  
9 to give at trial. Professor Podgursky rebuts the opinions of  
10 plaintiffs' expert Linda Darling-Hammond on the grounds that  
11 California student achievement data does not support Darling-  
12 Hammond's claim that there is a link between her definition of a  
13 "qualified" teacher" and student achievement gains; Darling-  
14 Hammond's report relies on studies that are irrelevant and/or  
15 methodologically flawed; and California teacher pay is  
16 competitive with that in other states. The foregoing statements  
17 are only a general summary of the issues and conclusions  
18 discussed and documented more fully in Professor Podgursky's  
19 expert report.

20 I declare under penalty of perjury that the foregoing  
21 is true and correct.

22 Executed this 18th day of April, 2003, at Los Angeles,  
23 California.

24  
25   
26 \_\_\_\_\_  
Paul B. Salvary  
27  
28

VITA

NAME MICHAEL JOHN PODGURSKY

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DATE OF BIRTH December 16, 1951

CITIZEN U.S.A.

ACADEMIC BACKGROUND

Degrees:

Ph.D., University of Wisconsin-Madison, 1980  
M.A., University of Wisconsin-Madison, 1976  
B.A., Cum Laude, University of Missouri-Columbia, 1974

PROFESSIONAL ASSOCIATIONS

American Economic Association  
American Statistical Association  
Society of Labor Economists

**EMPLOYMENT**

Middlebush Professor of Economics, Fall, 2002 - present

Professor of Economics and Chairman, University of Missouri - Columbia, Summer 1995 - present

Professor of Economics, Department of Economics, University of Massachusetts at Amherst, Fall, 1993 - Summer, 1995

Associate Professor of Economics, University of Massachusetts at Amherst, Fall, 1987 - Summer, 1993

Assistant Professor of Economics, University of Massachusetts at Amherst, Fall, 1980 - Summer, 1987.

Associate Director, Massachusetts Institute for Social and Economic Research, University of Massachusetts at Amherst, Summer 1992 - 1995.

Visiting Assistant Professor of Economics, Notre Dame University, Spring, 1986.

Cooperating Faculty, Labor Relations and Research Center University of Massachusetts, 1980 to present.

Lecturer, Department of Economics, Notre Dame University, 1979-80.

**PUBLICATIONS****Books:**

Dale Ballou and Michael Podgursky. Teacher Pay and Teacher Quality. Kalamazoo, MI: W.E. Upjohn Institute, 1997.

**Journal Articles:**

M. Podgursky, M. Ehlert, R. Monroe, D. Watson, J. Wittstruck. "Student Loan Defaults and Enrollment Persistence." Journal of Student Financial Aid. Forthcoming.

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D. Ballou and M. Podgursky. "Merit Pay Symposium: Let the Market Decide." Education Matters. Vol. 1 (1) Spring 2001, pp. 16-25

D. Ballou and M. Podgursky. "Reforming Teacher Preparation and Licensing: What Does the Evidence Show?" Teachers College Record Vol. 101, No. 1 (Winter 2000), pp. 5-26.

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M. Podgursky and P. Swaim. "Women and Job Displacement: An Empirical Model of Search Following Layoff." Eastern Economic Journal, Vol. 18, No. 1 (Winter 1992), pp. 111-124 (invited submission for an EEA Proceedings Volume).

M. Podgursky. "Changes in the Industrial Structure of Job Displacements: Evidence From the Displaced Worker Surveys." Monthly Labor Review, Vol. 115, No. 9 (September 1992), pp. 17-25.

P. Swaim and M. Podgursky. "The Distribution of Economic Losses Among Displaced Workers: A Replication." Journal of Human Resources Vol. 26 No.4 (Fall 1991) pp. 742-755.

P. Swaim and M. Podgursky. "Advance Notice and Job Search: The Value of an Early Start." Journal of Human Resources, Vol. 25 No. 2 (Spring 1990) pp. 147-178.

P. Swaim and M. Podgursky. "Do More Educated Workers Fare Better Following Job Displacement?" Monthly Labor Review, Vol. 112 No. 8 (August 1989) pp. 43-46.

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M. Podgursky. "Unions, Establishment Size, and Intra-Industry Threat Effects," Industrial and Labor Relations Review, Vol. 39 (January 1986), pp. 277-284.

M. Podgursky. "Sources of Secular Increases in the Unemployment Rate, 1969 to 1982," Monthly Labor Review, Vol. 107, No. 7 (July 1984), pp. 19-25.

M. Podgursky. "Unions and Family Income Inequality," Journal of Human Resources, Vol. 18, No. 4 (Fall 1983), pp. 574-591.



### Contributions to Edited Volumes:

- L. Solmon and M. Podgursky. "The Pros and Cons of Teacher Merit Pay." in Dennis L. Evans (ed.) Taking Sides: Secondary Education. New York: McGraw-Hill. 2002. pp. 180-190.
- M. Podgursky. "Regulation Versus Markets: The Case for Greater Flexibility in the Market for Public School Teachers." in Margaret Chang and Herbert Walberg (eds) Tomorrow's Teachers Richmond CA: McCutchan. 2002. pp. 117-148.
- D. Ballou and M. Podgursky. "Teacher Unions and Education Reform: Gaining Control of Professional Training and Licensing." in Thomas Loveless (ed.) Conflicting Missions: Teacher Unions and Educational Reform. Washington, D.C.: Brookings Institution, 2000, pp. 69-109.
- D. Ballou and M. Podgursky. "Teacher Training and Licensing: A Layman's Guide" in Chester Finn Jr and Marci Kanstoroom (eds.) Better Teachers, Better Schools. Washington D.C.: Fordham Foundation. (July, 1999), pp. 31-82.
- D. Ballou and M. Podgursky. "Rural Teachers and Schools" in Robert Gibbs, et. al., (eds.) Rural Education and Training in the New Economy, Robert Gibbs, Paul Swaim, Ruy Teixeira (eds.). Iowa State University Press, 1998, pp. 3-21.
- P. Swaim and M. Podgursky. "Displacement and Unemployment" in John Addison (ed.) Job Displacement: Consequences and Implications for Policy. Detroit: Wayne State University Press, 1991, pp. 136-161.
- M. Podgursky. "Job Displacement and Labor Market Adjustment: Evidence from the Displaced Worker Surveys," in Richard M. Cyert and David C. Mowery (eds.) The Impact of Technological Change on Employment and Growth. Cambridge, Mass.: Ballinger Press, 1988, pp. 3-41.
- R. Edwards and M. Podgursky. "Labor Unions: Context and Crisis" in Edwards, et.al., eds., The Capitalist System, 3rd ed. New York: Prentice-Hall, 1986, pp. 149-165.
- R. Edwards and M. Podgursky. "The Unraveling Accord: American Unions in Crisis," in Edwards, et.al., eds., Unions in Crisis and Beyond: Perspectives from Six Countries. Dover, Mass.: Auburn House Publishing Co., 1986, Ch. 2, pp. 14-60.
- M. Podgursky. "Labor Market Policy and Structural Adjustment," United States Congress, Joint Economic Committee, Policies for Industrial Growth in a Competitive World: A Volume of Essays, Washington, D.C.: Government Printing Office, April, 1984, pp. 71-96.

### Other Publications

- M. Podgursky. "Statistical Analyses of Economics NRC Scores." in Evaluating Research Productivity University of Kansas. Merrill Advanced Studies Center Report No. 105. June 2001. pp. 47-50.
- M. Podgursky and D. Ballou. Personnel Policy in Charter Schools. Washington, D.C.: Fordham Foundation., 2001.
- L. Solmon and M. Podgursky. The Pros and Cons of Teacher Merit Pay. Santa Monica: Milken Family Foundation. 2001.
- M. Podgursky. "Should States Subsidize National Board Certification of Teachers?" Education Week. April 4, 2001.
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M. Podgursky. Comment on "Federal Programs for Teacher Professional Development" in Diane Ravitch (ed.) Brookings Papers on Education Policy 2000, Washington, D.C. 2001. pp. 298-302.

"Symposium: What Data Are Available to Answer Charter School Questions?" Goldwater Institute Journal Vol. 1. No. 2 (June 2000), pp. 64-72.

D. Ballou and M. Podgursky. "Some Unanswered Questions Concerning National Board Certification" Education Week June 11 1998.

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D. Ballou and M. Podgursky. "Teacher Quality in Public and Private Schools," Proceedings of the Social Statistics Section, American Statistical Association Annual Meetings, 1994.

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#### **Book Reviews:**

Myron Lieberman. The Teacher Unions. Journal of Labor Research, forthcoming.

Myron Lieberman. The Teacher Unions, Opportunity, Vol. 2, No. 2 (Winter 1998) p. 15.

Susan Houseman. Industrial Restructuring With Job Security, Industrial and Labor Relations Review, Vol. 45, No. 4 (July 1992), p. 832.

Heidi Hartman, Robert Kraut, and Louise Tilly. Computer Chips and Paper Clips: Technology and Women's Employment, Industrial and Labor Relations Review, Vol. 40, No. 4 (July 1987), pp. 622-623.

Barry Bluestone and Bennett Harrison. The Deindustrialization of America, Labor Studies Journal, Vol. 9, No. 2 (Fall 1984), pp. 455-456.

Helen Ginsburg. Full Employment and Public Policy: The United States and Sweden, Industrial and Labor Relations Review, Vol. 37, No. 3 (April 1984), pp. 455-456.

## REPORTS

"NEAP Background Questions: What Can We Learn from NAEP About The Effect of Schools and Teachers On Student Achievement?" A Discussion Paper Prepared to the National Assessment Governing Board. 2002.

M. Wolkoff and M. Podgursky. "Wyoming School District Employee Compensation." Sacramento, CA: Management Analysis and Planning. 2002.

"Teacher Quality and Student Achievement Gaps: Statistical Indicators of the Quantity and Academic Quality of New Missouri Public School Teachers" Missouri K-16 Coalition , 2001

"A Statistical Analysis of the Labor Market for Missouri Public School Teachers: 1994-95 to 1998-99" Missouri Department of Elementary and Secondary Education. December, 1999.

"Quantity and Quality of Teacher Labor Supply". U.S. Department of Education. National Center for Education Statistics (1994)

"Changes in the Industrial Structure of Job Displacements: Evidence from the Displaced Worker Surveys." U.S. Department of Labor, ILAB/OIEA, Contract No. B9K13171 (August 1991).

"Estimated Economic Losses Due to Job Displacement: Evidence from the Displaced Worker Surveys." Washington, D.C.: Economic Policy Institute (April 1991).

"Job Displacement and Labor Market Mobility," , U.S. Department of Labor, Employment and Training Administration, Contract No. 998-3481-75-085-01. (February 1990) (with Paul Swaim).

"Job Displacement, Reemployment, and Earnings Loss: Evidence from the January, 1984 Displaced Worker Survey," National Commission for Employment Policy, Research Report 86-18 (June 1986) (with P. Swaim)

"Labor Market Adjustment and Job Displacement: Evidence from the Displaced Worker Survey," U.S. Department of Labor, Bureau of International Labor Affairs Contract No. J9K50001. (January 1986).(with Paul Swaim)

"Trade Unions and Income Inequality," Madison, Wisconsin: Institute for Research on Poverty, Discussion Paper #644-81, 1981.

"The Incidence of Massachusetts Sales Taxes: An Analysis of Current and Alternative Structures," Massachusetts Economic Policy Analysis Project (September 1981).

"Occupational Classification Systems and Vocational Education Planning." Jefferson City: Missouri Occupational Training Information System, State Department of Education, 1975. (with Alan Roskam).

### Referee/ Reviewer:

American Economic Review, Review of Economics and Statistics, Journal of Human Resources, Industrial and Labor Relations Review, Industrial Relations, Growth and Change, Applied Economics, Cambridge Journal of Economics, Small Business Economics, Contemporary Policy Issues, Eastern Economic Journal, Education Matters, Teachers College Record, Educational Researcher, Economics of Education Review

National Science Foundation, Smith-Richardson Foundation, Fordham Foundation

### Other Service

Advisory Board. National Center for Teacher Quality. Washington, D.C. 2000-present.

Advisory Board. American Board for Certification of Teachers Excellent, Washington, D.C. 2001- present

### Recent Funded Research

Missouri Department of Higher Education. Affordability, Access and Performance of Missouri Public Higher Education Institutions. 2000-2003 (\$490,000)

Smith Richardson Foundation. Personnel Policy in Traditional Public, Private, and Charter Schools 2001- (\$63,000)

Fordham Foundation. Personnel Policy in Charter Schools 1999-2001 (\$28,000)

Fordham Foundation. Teacher Training and Licensing 1999-2000 (\$14,000)

National Science Foundation Instrumentation Grant 1999-2001 (\$45,000)

Missouri Department of Elementary and Secondary Education. Teacher Supply and Demand Study 1999-2000 (\$96,000)

W. E. Upjohn Institute for Employment Research. Teacher Compensation. 1994-1997 (\$50,000)

U.S. Department of Agriculture. Economic Research Service. Rural Teachers and Schools. 1995-96 (\$45,000)

U.S. Department of Education. National Center for Education Statistics. Teacher Quality and Turnover. 1994-95 (\$25,000)

### SELECTED CONFERENCE AND SEMINAR PRESENTATIONS

"Teacher Mobility, Pay, and Academic Quality" Society of Labor Economists Annual Meeting. Baltimore. May, 2002.

"Sorting by Academic Quality in the Public School Teacher Labor Market" Human Resources Seminar. Iowa State University. Nov. 8, 2001.

Invited panelist. "Teacher Excellence: Preparing and Retaining the Best" Education Leaders Council. 6th Annual Conference. Atlanta, GA. September 28, 2001.

"State and Federal Teacher Quality Policies" 2000-2001 National Education Conference. Milken Family Foundation. Los Angeles, CA. June 24-26, 2001.

Invited Panelist. "The Role of Teachers' Unions: Advocate, Adversary -- or Both?" Education Writers Association Retreat. Michigan Journalism Fellows Program. University of Michigan, Ann Arbor March 9-10, 2001.

"Student Loan Defaults and Enrollment Persistence" 17th Annual NASSGAP/NCHELP Financial Aid Research Conference. St. Louis, MO. June 9, 2000.

"Regulation Versus Markets: The Case for Greater Flexibility in the Market for Public School Teachers." American Education Research Association Annual Meetings. New Orleans, LA. April 26, 2000

Invited Panelist. "Do We Need Schools of Education?" Education Writers Association. 53rd National Seminar. April 14, 2000. Atlanta, GA.

"What Data Are Available to Answer Charter School Questions?" Charter School Research Conference. The Goldwater Institute. Scottsdale, AZ. February 11-12, 2000.

"Seniority, Wages and Turnover Among Public School Teachers." Devising Incentives to Promote Human Capital Conference. National Academy of Sciences. Beckman Center. Irvine CA Dec. 17-18, 1999.

"State Strategies for Redesigning Teacher Preparation" National Conference of State Legislatures. Indianapolis, IN July 24, 1999.

"Regulation Versus Markets: The Case for Greater Flexibility in the Market for Public School Teachers." New Teachers for a New Century Conference. Johnson Wingspread Conference Center. Racine WI Nov. 17-19, 1999.

"Are NCATE Teachers Better?" 1999 Conference on Standards-Based K-12 Education. California State University - Northridge, May 24, 1999.

"Federal Programs for Teacher Professional Development" Invited Discussant. Brookings Papers on Economic Policy Conference. Brookings Institution. Washington, D.C. May 17-18, 1999.

"Teacher Unions and Education Reform: Gaining Control of Professional Licensing and Advancement." Teacher Unions and Education Reform Conference. Kennedy School of Government. Harvard University. Sept. 24-25, 1998.

"The Recommendations of the National Commission on Teaching and America's Future: An Economist's Perspective." National Association of State Directors of Teacher Education and Licensing (NASDTEC), Rapid City, SD, June 29, 1998.

"Teacher, Pay and Incentives." World Bank Human Development Conference, Washington, D.C., March 5, 1998

"A Critical Appraisal of the Report of the National Commission on Teaching and America's Future." Education Leaders Council National Conference. Dallas, Texas, September 20, 1997

"The Future of Privatization." Edventures '97. Vanderbilt University, August 1, 1997

"Teacher Pay and Teacher Quality." Economics Department, Kansas State University, April, 1997

"Do Public Schools Hire the Best Applicants?" Econometric Society Winter Meetings. January 7, 1995

"Teacher Quality and Personnel Policy in Public and Private Schools." American Statistical Association Annual Meetings. Toronto, August 18, 1994

"Can We Recruit Better Teachers?" ASSA, Boston, January 4, 1994

"Implicit Markets for Teacher and School Characteristics" American Statistical Association Annual Meetings. San Francisco, August 9, 1993

"Pay Structures in Private Schools: Are There Lessons for Public Schools?" AEA, Anaheim, January 6, 1993

"Female Labor Supply Following Displacement" ASSA, New Orleans, January 5, 1992

#### CURRENT RESEARCH INTERESTS

Teacher Labor Markets, Organizational Behavior Of Traditional Public, Private, and Charter Schools

4/15/03

**Access to Teacher Quality in California Public Schools**

**A Rebuttal to Professor Linda Darling-Hammond**

**Michael Podgursky  
Department of Economics  
University of Missouri  
Columbia, MO 65211**

## **I. INTRODUCTION AND OVERVIEW**

I was asked by Paul Salvaty of O'Melveny & Myers to critically review the expert report of Professor Linda Darling-Hammond. The following report provides my assessment.

In her expert report, Professor Darling-Hammond begins her analysis by providing an overview of California's credentialing requirements. She outlines the requirements for obtaining one of California's two types of "full" teaching credentials (single subject and multiple subject) and identifies the differences between a "full" credential and a "preliminary" credential. (Report at 7-8). Professor Darling-Hammond argues that only those teachers that have obtained either a "full" or "preliminary" credential can be considered "qualified" teachers. (Report at 14.) Professor Darling-Hammond also discusses the requirements for obtaining an "intern credential" and for obtaining an "emergency permit" and a "pre-intern credential." (Report at 12-14.) Professor Darling-Hammond considers teachers with any of these other credentials to be "unqualified." (Report at 35.)

After providing this overview of California's credentialing requirements, Professor Darling-Hammond argues at great length that California has failed to provide its students with equal access to qualified teachers. Citing extensive research that suggests that good teachers have a positive impact on student achievement, Professor Darling-Hammond insists that California has an absolute duty to ensure that *all* students are taught by a teacher that meets her definition of "qualified" – that is, a teacher with a "full" or "preliminary" credential, not one with an "intern" credential nor an "emergency permit" or a "pre-intern" credential. (Report at 79.) She maintains that there are "large and growing" disparities in California children's access to "well-qualified" teachers. (Report at 35.) And she attributes these disparities to, among other things, California's "noncompetitive teacher salaries," its "poor working conditions" and various State actions that she claims unduly "restrict" the "pool of qualified teachers" and contribute to high teacher attrition. (Report at 55-63.)

To address these issues, Professor Darling-Hammond proposes that the State should "immediately" be compelled to make sure that no school has "more than 20% of its teachers lacking full preliminary or clear certification." She emphasizes that this 20% limit is only a temporary solution and still falls far short of what she believes to be the "constitutional standard." (Report at 79.) Thus, it would appear that Professor Darling-Hammond believes that California is constitutionally required to make sure that *all* California teachers in all classrooms throughout the State meet her definition of "qualified." Conversely, Professor Darling-Hammond apparently believes that all teachers who do *not* meet her definition of "qualified" (including those with "intern" credentials) should – as a general rule at least -- be banned from teaching in public schools altogether. In order to ensure that her standard is met, Professor Darling-Hammond proposes that California "prohibit" low performing schools from "having more than the state average proportion of teachers without preliminary or clear

credentials” and that California “require” schools to show “annual progress” in their hiring of “qualified” teachers. (Report at 80.) In addition, Professor Darling-Hammond proposes that the “legislature set a goal of phasing out of the approval of waivers and emergency permits over the next 5 years,” allowing waivers only in “exceptional cases where specialized individual skill and talent or eminence is involved.” (Report at 79-80.) Professor Darling-Hammond does not analyze the feasibility of implementing her proposed standard nor does she offer any analysis of the potential costs.

With respect to teacher salaries, Professor Darling-Hammond proposes that the State should “make teaching in hard-to-staff schools more attractive by offering better salaries, working conditions, and mentoring.” (Report at 81.) She suggests possibly “raising and equalizing salaries across districts” and “creating salary aid that rewards candidates for becoming well-prepared and districts for hiring well-prepared teachers.”<sup>1</sup> (Report at 81.)

For reasons that will be discussed below, Professor Darling-Hammond’s analysis is flawed in several fundamental respects. First, Professor Darling-Hammond’s attempt to demonstrate a link between her definition of a “qualified teacher” and improved student achievement is not supported by California student achievement data. As demonstrated below, there is no statistically significant positive relationship between the percent of teachers with preliminary or full credentials and student achievement gains. The studies of California student achievement and teacher credentials Professor Darling-Hammond cites are flawed in that they do not examine the relationship between student achievement gains and teacher credentials. The studies with national data cited by Professor Darling-Hammond usually do not meet the minimum standards for reliable policy research in this area. In addition, given the wide variation in certification standards across states, the national studies she cites are of limited relevance in considering the effect of California teaching certificates and student achievement.

With respect to teacher pay, Professor Darling-Hammond’s argues that the pay of California teachers is low and very unequal. However, the former conclusion rests entirely on the use of a state-by-state “cost of living” index constructed by the American Federation of Teachers (AFT). The methodology used in constructing this index is not well-grounded in economic theory. When more reliable data from the U.S. Department of Labor are used, the relative hourly pay of California teachers compares quite favorably with that of many other professions in major California metropolitan labor markets.

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<sup>1</sup> Among Professor Darling-Hammond’s other proposed remedies, she argues that the State should take other actions including, expanding its “investigatory” and “enforcement” powers; requiring districts to provide additional information concerning its teaching staff and hiring efforts; conducting a “full and complete state audit,” imposing “closer scrutiny” and require independent verification of facts” concerning unavailability of preliminary or fully certified teachers, and “require [ing] overhaul of non-functioning recruitment and hiring systems.” (p. 80) In effect, Professor Darling-Hammond would have CTC regulators in Sacramento take over the hiring and personnel decisions of hundreds of local school districts. I am aware of no precedent for this in any other state.

There is also little evidence that variation in teacher pay by school districts is any higher in California as compared to other states with a mix of large urban and rural districts.

## **II. BACKGROUND AND QUALIFICATIONS**

I am the Middlebush Professor of Economics and Chairman of the Department of Economics of the University of Missouri --Columbia. I received a Bachelor of Arts degree from the University of Missouri --Columbia in 1974. My Master of Arts and Ph.D. degrees, both in Economics, were conferred by the University of Wisconsin --Madison.

My employment since 1980 has been in the teaching of economics in higher education institutions and in economic and statistical research. I was an Assistant Professor of Economics at the University of Massachusetts at Amherst from 1980 until 1987. I became an Associate Professor of Economics at that institution in 1987, and a full Professor in 1993. I continued teaching at the University of Massachusetts --Amherst until 1995, when I came to Columbia to take the position of Professor in the Department of Economics and Chairman of the Economics Department. I have taught both graduate and undergraduate courses in econometrics and in education policy.

From 1992-95, I also was the Associate Director of the Massachusetts Institute for Social and Economic Research (MISER) at the University of Massachusetts at Amherst. MISER is an interdisciplinary research institute of the College of Social and Behavioral Sciences. MISER provides research services to the University, the Commonwealth of Massachusetts, and national and international audiences, on a variety of social, economic and demographic issues. Education research conducted by MISER during my tenure included analyses of enrollment, staffing, and costs of education and educational attainment.

My own scholarly research has focused on subjects including teacher labor markets, organizational behavior of different types of schools, and economic and statistical analysis of a variety of issues affecting the quality of teachers and teaching. I co-authored a book on teacher pay and teacher quality in 1997, and have authored or co-authored more than 20 articles in peer-reviewed professional journals. I have contributed articles or chapters on economic issues, including issues in education, to 10 books. In addition, I have authored numerous articles that have appeared in professional and trade publications (other than scholarly reviews) on topics in economics and economic and statistical analysis. Many of those articles addressed education issues.

I have undertaken a variety of consulting projects involving education since I began teaching and working in Missouri. The Missouri Department of Elementary and Secondary Education and the Missouri Department of Higher Education engaged me, with colleagues at the University of Missouri, to develop statistical analyses of teacher supply and demand for its "K-16 Task Force on Achievement Gap Elimination." Elements of our analysis were incorporated in the Report of the Task Force on



Achievement Gap Elimination that was issued in spring 2002. I also have studied teacher quality and turnover for the United States Department of Education, National Center for Educational Statistics. I have conducted a study on rural teachers and schools for the Economic Research Service of the United States Department of Agriculture. I also have conducted research studies on teacher training and compensation for the Fordham Foundation, the Smith-Richardson Foundation, and the W.E. Upjohn Institute for Employment Research.

**III. CALIFORNIA STUDENT ACHIEVEMENT DATA DOES NOT SUPPORT PROFESSOR DARLING-HAMMOND'S CLAIM THAT THERE IS A LINK BETWEEN HER DEFINITION OF A "QUALIFIED TEACHER" AND STUDENT ACHIEVEMENT GAINS.**

Since California students are tested every year, it is possible to estimate the effect of teacher characteristics on student achievement gains at certain grade levels for cohorts of students passing through a school. A gain-score approach is superior to a cross-section approach (a single point-in-time approach employed in the other California studies Professor Darling-Hammond cites) in several respects. First, it is a more accurate way to estimate the effect of teachers in a given year at any grade level. The cross-section approaches implicitly assume that current student achievement is explained only by current teacher characteristics and take no account of teachers in earlier grades or earlier years. However, the math scores of students at grade five depend not only on the grade five teachers but also on all previous teachers. By examining gain-scores from grade four to grade five, I isolate the contribution of grade five teachers.

The gain score approach is preferred because it reduces the bias due to the way in which students are assigned to classroom teachers. If a group of students in a particular school is particularly disadvantaged – *i.e.*, in ways that are not captured by crude SES measures like free and reduced lunch eligibility (FRL) – and this disadvantage persists from one year to the next, then by focusing on achievement gains the bias due to these factors will be eliminated.

Tables 1 and 2 and Charts 1-4 shows the results of these estimates. The dependent variable in this study is the percent of students in the grade who score at or above the 50<sup>th</sup> percentile on the mathematics SAT9 in spring 2002. I have chosen two grade levels: 5 and 8. These grades were chosen to permit me to track a cohort of students for one year through a building and link achievement gains to grade-level teachers. At other grade levels the cohorts often leave a building. I use two measures of “uncertified” teachers. The first is the percent of teachers who do not have preliminary or full (clear) certification. This is a direct test of the plaintiffs’ and Darling-Hammond’s remedy. The second is the percent of teachers with emergency certificates – a measure used in two of the studies cited by Professor Darling-Hammond. (Fetler, 1999; Goe, 2002)

We begin with Chart 1, which reports the 5<sup>th</sup> grade math results. The first bar on the graph shows the very strong negative relationship between the percent of teachers in a

school without preliminary or regular (clear) certification and student achievement. This tells us that for every one percent increase in the percent of 5<sup>th</sup> grade teachers without preliminary or full certification, the percent of students scoring above the fiftieth percentile falls by .217 percent. The statistics in Table 1 show that this is a large and statistically significant relationship. A similar large negative relationship is found at grade 8 (Table 2 and Charts 3-4).

However, low SES schools tend to have greater concentrations of uncertified teachers and SES affects student achievement. When I control for the percent of students who are eligible for free and reduced price lunch, the relationship between certification and achievement drops sharply. In the case of 5<sup>th</sup> grade math, the coefficient falls by 82 percent. For 8<sup>th</sup> grade math, the coefficient falls by 72 percent. Nonetheless, at both 5<sup>th</sup> and 8<sup>th</sup> grade it remains statistically significant. Note that in all four graphs, the estimated coefficient on any measure of uncertified teachers falls sharply when I introduce this crude control for student SES.

The percent of students eligible for FRL was the primary control for student SES in the Betts, *et. al.* (2000) study. However, it is a poor measure of home educational resources. This is readily seen in chart 5 where I plot data on FRL eligibility for the largest California school districts. In every case, the percent of students classified as FRL-eligible falls with grade level, reflecting the well-known tendency for upper level students to avoid the FRL program. Thus, at upper grade levels, the FRL measure underestimates the extent of student poverty. Given the very limited data available on student socioeconomic status, and the powerful effect of the latter on student performance, the appropriate way to measure teacher effects on student achievement is to focus on annual student achievement gains.

We can measure annual achievement gain by subtracting the achievement measure at grade five from the grade four measure one year earlier. Thus, for elementary teachers our dependent variable is the grade 5 score in 2002 minus the grade 4 score in 2001, and for the secondary math teachers, it's the grade 8 math score minus the grade 7 score. If the composition of teacher certification types in a school affects student achievement, we would expect to see a negative relationship between student achievement gains and the percent of teachers at the relevant grade level lacking full or preliminary certification. However, in none of the four cases do we find a significant negative effect. Instead, the sign of the percent of teachers without preliminary or full clear certificates is positive in all four cases and is weakly significant in one of four cases. Thus, these gain score data suggest a positive association between student achievement gains and the percent of uncertified teachers in a grade.

In sum, California student achievement data do not support Professor Darling-Hammond's claim that a higher proportion of teachers lacking full or preliminary certification lowers student achievement.

#### **IV. PROFESSOR DARLING-HAMMOND RELIES ON STUDIES THAT DO NOT SUPPORT HER POSITION.**

Professor Darling-Hammond does not analyze actual student test scores in her report. Instead, Professor Darling-Hammond points to a large body of research that shows that good teachers have a positive impact on student achievement. But the vast majority of the research cited by Professor Darling-Hammond does not support her position in this case. While it is true that there is substantial research concerning the positive impact of quality teachers on student achievement, the definition of a “quality teacher” is elusive. Professor Darling-Hammond’s argument in this case depends not merely on evidence showing that “quality teachers” matter, but rather on evidence showing that teachers meeting her definition of “qualified” are so important that the State is constitutionally obligated to undertake the sweeping and costly reforms that she suggests.

Putting aside the large number of studies analyzing the question of teacher quality in general, Professor Darling-Hammond’s report actually cites little reliable evidence in the published literature to support her proposed remedy. Many of the studies that Professor Darling-Hammond cites are methodologically weak and not consistent with current research standards on the effect of teachers on student achievement. In addition, given the wide variation across states in teacher certification standards, which she herself acknowledges in her written work, it is not clear what relevance these studies have for the particular remedy proposed by Professor Darling-Hammond and the plaintiffs.

**A. Professor Darling-Hammond’s Evidence Purporting to Link California’s Teacher Certification Requirements to Student Achievement Is Weak**

Darling-Hammond cites three studies – one by Betts, Reuben and Dannenberg (2000), one by Fetler (1999) and one by Goe (2002) -- purporting to show an effect of teacher certification on student achievement in California public schools. In her report, she claims:

“Several recent studies in California have pointed to strong relationships between measures of teacher qualifications and student achievement, with teacher certification status and experience being among the strongest and most consistent predictors of student achievement, in addition to student socioeconomic status. Certification status generally shows a larger effect size than experience. (p. 16)”

The Betts, Reuben, and Dannebeng report (2000) has cross section estimates of the effect the percent of teachers holding preliminary and full clear certificates certified on STAR scores by school for grades 2-11. The Fetler report (1999) estimates the relationship between math teachers on emergency permits and ninth grade math STAR scores. Finally, Goe (2002) estimates the relationship between overall school academic performance measures (API scores) and the percent of teachers on emergency permits.

There are at least two reasons why these reports are inadequate to substantiate Darling-Hammond's position. First, note that only one of these studies, Betts, et. al. (2000), tests the relevant hypothesis (*i.e.*, the effect of the percent of teachers with preliminary and full clear credentials). Goe and Fetler examine only emergency permits. They do not examine the effect of waivers, pre-intern, or intern certificates.

Second, none of the three studies meet the methodological minimum standard that should be expected of studies of the effect of teachers on student achievement. All three of these studies are cross-section studies that have no controls for prior student achievement. It may be that differences in student achievement on the Spring STAR exam between teachers with different types of certification is due to the types of students to whom they are assigned in the fall and not due to their teacher effectiveness. In a research design there are two ways to control for this student assignment effect. One way would be to randomly assign students to classrooms of teachers with different types of certification and then measure spring student achievement. Another would be to control statistically for the prior level of student achievement. The studies cited by Darling-Hammond do neither.

In sum, Professor Darling Hammond has failed to show that the percent of teachers with preliminary or clear certification in a school has a positive effect on student achievement gains. The studies that she cites are methodologically flawed in their estimation of teacher effects on student achievement. As previously discussed, my own analysis of the percent of teachers with preliminary or full certification on student achievement gains finds no evidence of a positive effect.

**B. Professor Darling-Hammond's "National Evidence" of a Link Between Teacher Certification and Student Achievement Is Irrelevant and Often Methodologically Flawed**

As discussed, Professor Darling-Hammond attempts to make the case that "qualified teachers," by her definition, have a substantial effect on student achievement. However, much of the research Darling-Hammond cites on teacher certification is methodologically below current research standards or is irrelevant to the proposed remedy in this case

Professor Darling-Hammond cites research by William Sanders (Sanders and Horn, 1994; Sanders and Rivers, 1996) and Eric Hanushek (Hanushek, 1992; Hanushek, Kain, and Rivkin, 1999; Rivkin, Hanushek, and Kain, 2000) that analyzes student-level longitudinal achievement data to show that that variation in teacher quality makes a significant contribution to variation in student achievement. These are methodologically sophisticated studies. They identify the effect of teachers indirectly, *i.e.*, as persistent differences in achievement gains between classrooms. However, these studies tell us little or nothing about teacher certification and the remedies sought by the plaintiffs in this case. In none of these studies do the authors investigate the link to teacher certification (in California or elsewhere). In fact, the vast majority of the variation in teacher classroom effects that they observe is variation in effectiveness among fully

certified teachers. If anything, this research demonstrates that certification is a poor quality control device, with many low performing teachers passing through the certification sieve.

The remedy proposed by the plaintiffs in this case focuses on preliminary and full teacher certification, not on the more general issue of teacher quality or “teacher effects” on student achievement. Unfortunately, the research literature that examines the effect of teacher certification on student achievement is limited and typically much less methodologically sophisticated. Very few of these studies meet the current methodological standards for policy evaluation research, and these findings are of limited relevance for the plaintiffs’ proposed remedy. In particular, none of studies has a research design with random assignment of students to teachers, and few of these studies have controls for prior achievement of the students.

The most serious shortcoming of most of the articles cited by Darling-Hammond purporting to show a link between student achievement and teacher certification is the lack randomization or of controls for prior student achievement. The ideal research design for evaluating the effect of a teacher on student achievement would have random assignment of students to classrooms of certified and uncertified but otherwise comparable (*e.g.*, experience) teachers within a school. But research on teachers involving random assignment is rare, although there are strong pressures in the Institute for Education Sciences of U.S. Department of Education for more (Hosteller and Boruch, 2002; U.S. Department of Education, undated). Some random assignment teacher studies are under way. Mathematica Policy Research, a highly regarded research institute with considerable experience in conducting social policy experiments, is conducting research on the effect of Teach for America and alternative teacher certification using a randomized study design.

If students are randomly assigned to classrooms, then data on prior student achievement is not necessary. If we have a large sample of certified and uncertified teachers, then we need only compare the spring assessment scores of the students of certified and uncertified teachers to estimate the effect of teacher certification. However, if randomization is not possible, then if one is to measure the contribution of a classroom teacher to student achievement, it is necessary to control for prior achievement of the student before he or she enters the classroom. Ideally, researchers would pretest the students in the fall and test them again in the spring. The difference in these scores, averaged over the classroom, would be a measure of the teacher’s “value-added.”

If students are not pre-tested in the fall, then it is also possible to link student achievement test scores from one year to the next if students are tested annually. These are called longitudinal student achievement data files. Large longitudinal student achievement datafiles have formed the basis for the most sophisticated current research on teachers and teacher effects on student achievement (Sanders and Horn, 1994; Hanushek, 1992; Hanushek, Kain, and Rivkin, 1999; Rivkin, Hanushek, and Kain, 2000).

If research studies on teacher effects on student achievement do not have a randomized design or do not control for prior student achievement they simply do not meet the current standards for scientific policy evaluation research.

Studies that do not have a rigorous study design, *i.e.*, without randomization or controls for prior student achievement, are likely to produce seriously biased estimates of the effect of teacher certification on student achievement. The reason is that they do not adequately control for the socioeconomic background of students in classrooms. A recent study by Hoxby (2001) highlights the importance of these socioeconomic variables. Hoxby analyzed the effect of family, neighborhood, and school input variables on student achievement and educational attainment using two large nationally representative longitudinal studies of students (the National Educational Longitudinal Survey, NELS88, and the National Longitudinal Survey of Youth, which began in 1979). The list of variables included in each of the areas is extensive. Family variables include parent's education, family income, student race and ethnicity, books at home, etc. The school input variables include per-pupil spending, average class size, average teacher salary, maximum teacher salary, percent of teachers with MA's, average experience of the teacher, teacher certification status, and other information on school resources. Community variables include income and demographic data on households in the school district and city.

Hoxby compared the percent of the variation in student achievement on various field tests (math, reading) explained by each of these sets of factors. For every test, the percent of the variation explained by the family variables far exceeded the school input variables. The family variables explained from 34 to 105 times as much variation in student achievement test scores as the school input variables. She also examined years of schooling completed at age 33. Family variables explained 19 times as much variation in student educational attainment as did school inputs.

The point here is not that schools or teachers do not matter. Rather it is that the effect of socioeconomic variables is very powerful relative to the measured school and teacher factors. This means that failing to adequately take account of the family background variables in a study can lead to very inaccurate estimates of the effect of school input variables if these socioeconomic variables are correlated with the school input variables.

Now return to the question of teacher certification. The mere fact that a poor school district has a higher percentage of teachers lacking full certification and a large number of low-performing students does not prove that there is a link between "certified teachers" and improved student achievement. The statistical problem is in disentangling the effect of household factors from the effect of the type of teacher certification. The only way to do this with any confidence is to conduct randomized studies or use data that permits controlling for prior levels of student achievement in assessing teacher contributions.

I count 206 references in Professor Darling Hammond's report. However, as best as I can determine, only two of these studies focus on teacher certification and meet the research standard set out above. None of the studies of teacher certification employs a randomized study design. Only two of the studies use longitudinal data on students to control for prior achievement (Goldhaber and Brewer, 2000; and Raymond, et.al., 2001).<sup>2</sup>

The first study, Goldhaber and Brewer (2000), analyzes grades 8 to 10 math score gains and the credentials of the math teachers. The findings of this study are mixed. Teachers holding math certification on average produced gains that were only modestly higher than those of math teachers who reported that they held private school certification or certification out of subject. On the other hand, math teachers with emergency certification did no worse than teachers with regular certification. For science teachers, none of the certification variables were statistically significant. In other words, for science teachers, Goldhaber and Brewer found no evidence that fully certified teachers were any better or worse than teachers with emergency or no certification whatsoever.<sup>3</sup>

The second study, which has not yet been published in a refereed scholarly journal, is Raymond, et. al. (2001). Raymond and colleagues analyze longitudinal data student achievement data in the Houston Independent School district. Their focus is on the Teach for America (TFA) recruits. These TFA teachers do not hold regular teacher certification. They are recent college graduates who receive 120 hours of instruction during the summer prior to entering teaching via the emergency certificates or waivers. Raymond, *et al.* found that the student achievement gains of TFA-taught students were as high as those of other teachers, including those entering through conventional routes. Darling-Hammond (p. 94) is critical of this study and argues that TFA teachers should be compared only to conventionally trained teachers and not to the typical new Houston teacher, many of whom are uncertified.

Thus, the findings of the only two methodologically sound studies cited in Darling-Hammond's report can be characterized as "mixed" at best. Neither of the studies assesses the effect of something like the California internship certificate. Both of the studies have been criticized as invalid by Darling-Hammond herself. These two articles clearly are not sufficient to support the sweeping and costly reforms to

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<sup>2</sup> Darling-Hammond (p. 95) seems to believe that the North Carolina study of 36 teachers (Hawk, Coble, and Swanson, 1985) is a study of achievement gains. It is not. These authors did not compute achievement gains. Had they done so they would have found no significant differences between the certified and uncertified teachers. Darling-Hammond writes: "... teachers' certification in mathematics has a large and statistically significant effect on student achievement gains in both general mathematics and, even more profoundly, in algebra." In fact, the results for algebra are based on 28 students of certified teachers and 16 students of uncertified teachers. This suggests that the uncertified results are based on a single teacher. This is not a "profound" result. This is not a study that meets current standards for a rigorous policy evaluation study.

<sup>3</sup> Interestingly, Darling-Hammond published a critique of the Goldhaber and Brewer study, arguing, among other things, that the standards for certification vary so widely across states that national studies cannot tell us a great deal about the effect of certification in any state (Darling-Hammond, Berry, Thoreson, 2001).

California's teacher requirements proposed by plaintiffs and Professor Darling-Hammond.

**C. Professor Darling-Hammond's Proposal to Ban Teachers With Intern Credentials Has No Basis in Research and May Suppress an Innovative Program.**

The "interim" remedy sought by the plaintiffs and advocated by Professor Darling-Hammond is that no school in California be permitted to have more than 20 percent of its teachers without preliminary or full clear teaching credentials in their teaching area. Under plaintiffs' proposal, schools at the 20 percent threshold would be prevented from hiring teachers with emergency permits or waivers, as well as teachers with internship or pre-internship certificates. Thus, if school A had 25 percent of its teachers holding a preliminary credential but school B had 15 percent of its teachers with preliminary credentials and ten percent of its teachers in a pre-intern or intern program, then school B would be in violation of this regulation.

Professor Darling-Hammond views the 20 percent rule as a "short run" solution. In her view, the State has a constitutional responsibility to keep all intern teachers out of the classroom (at 79).

It should be noted that many of the teachers who are excluded from employment under this rule have, in fact, met many of the requirements for a clear teaching credential. As discussed in Darling-Hammond's report, teachers on emergency permits must have a baccalaureate degree or higher degree from a regionally accredited university, must have passed the California Basic Educational Skills Test (CBEST) exam, and must have some demonstrated content knowledge. (Report at 13.)

Teachers in internship programs must meet similar requirements and are in an institute of higher education (IHE) or district-sponsored training programs that lead to a full clear teaching credential within one or two years. (Report at 13.) California has roughly 8,500 teachers with internship certificates (McKibbon, 2002). McKibbon notes that the "first goal" of the internship program is "... to expand the pool of qualified teachers by attracting persons into teaching who might not otherwise enter the classroom and those who bring valuable backgrounds into teaching." He notes that since the program's inception in the 1996-97 school year, the program has attracted scientists, engineers, and other professionals laid off from the aerospace and other defense-related industries, retired military personnel, and other career changers. He notes that the program has been quite successful in recruiting minority and male teachers. More than 46 percent of interns come from minority groups (ethnic, linguistic, or racial), which is twice that of traditional route candidates (i.e., preliminary certification). In addition, nearly 30 percent of elementary interns are male, as compared to under ten percent of traditional route candidates (McKibbon, pp. 4-5). McKibbon (p. 9) also notes that "The interns tend to stay in [hardest-to-staff] classrooms at far greater rates than persons prepared by other methods."



Under the rule proposed by the plaintiffs and endorsed by Professor Darling-Hammond, teachers in these internship programs, most of which are operated by the same education schools that train traditional route teachers, would be considered no better prepared than a teacher lacking any type of certification or having a waiver. Since most intern programs are two-year programs leading to full, clear certification, in fact, an experienced teacher holding an intern certificate is closer to full clear certification than is a new teacher with a preliminary certificate. Yet under her interpretation of the State's constitutional requirement, these interns would be banned from public school classrooms altogether.

Imposing plaintiffs' rigid requirements on the mix of certificates in all schools in California would undoubtedly exclude many otherwise qualified teachers from public school employment and would raise costs for public schools. Professor Darling-Hammond cites hundreds of studies on a variety of topics concerning teachers. However, she fails to produce any convincing evidence that eliminating California's intern program would raise student achievement. Nor does she address the obvious practical concerns raised by her proposals, such as the manner in which the proposals would be implemented or their costs.

#### **D. Wide Variation in Certification Standards Between States and Over Time Undermines Research Relevance.**

In considering research on teacher certification and student achievement, it is also important to recognize that certification standards vary widely from state-to-state. This means that a study conducted based on the standards of another state may be of limited relevance to plaintiffs' claims and proposals in this case. Note that the plaintiffs in this case want to restrict the use of intern or pre-intern certificates by California school districts. However, to the best of my knowledge, California is the only state that issues an intern or pre-intern teaching certificate. Thus, research from other states cannot tell us a great deal about the effect of intern or pre-intern certificated teachers on student achievement.

In comparing certification standards across states, the evidence suggests that the requirements for a standard ("clear") teaching credential in California are more rigorous than those in other states. While all states require baccalaureate degrees for classroom teachers, California is one of only thirteen states requiring that this degree be in a particular content area (e.g., English, mathematics) and not merely in education. Pedagogical training is in addition to the content knowledge required for a baccalaureate degree. California requires a general academic skills test (CBEST) of all teaching candidates. Only 40 of fifty states have such a requirement. California also requires a test of subject knowledge (34 states) and subject-specific pedagogy (23 states). Only 22 states require all three (Education Week. Quality Counts 2003, p. 90). In part because of its extensive requirements for regular teacher certification, Education Week recently awarded California the sixth highest grade on "Improving Teacher Quality" in the nation in the 2003 report. By contrast, states such as Kansas, Utah, and Iowa do not test teachers at all, and do not require teachers to have academic majors.

Even if one disputes the Education Week scoring system that places California near the top of states in licensing standards, any objective observer reviewing the extensive data they have compiled on teacher certification and training standards by state would conclude that these standards vary greatly among the states. This wide variation across states in the requirements for regular or standard certification (and hence, what is less-than-full certification) means that studies purporting to show a relationship between standard “certification” and student achievement in one state may not be relevant for another state.

California’s standards differ considerably from those in Texas. However, when Darling-Hammond cites studies of teacher certification and student achievement in Texas (Fuller, 1998, 2000) she makes no attempt to establish their relevance to California by comparing the certification criteria in the two states. In another example, Darling-Hammond (p. 21) cites a study of 36 math teachers, some certified and some uncertified, in North Carolina in the early 1980’s (Hawk, Coble, and Swanson, 1985). Elsewhere I have criticized the weak statistical methodology in this study (Walsh and Podgursky, 2002). However, putting that matter aside, one must ask what relevance such a study has to a comparison of intern or pre-intern teachers in California in 2003. Nearly all states have increased their standards for teacher certification since the early 1980’s, most notably North Carolina. In all likelihood, on average, the typical math intern and even the pre-intern teacher in California possess more content and pedagogical knowledge than the sixteen uncertified math teachers in this North Carolina study. Darling-Hammond presents no evidence on this matter.

In fact, Darling-Hammond makes exactly this same point in her recent critique of a study of the effect of teacher certification on student achievement (Goldhaber and Brewer, 2000). It is worth quoting Darling-Hammond at length on this point:

Regular certification standards also vary widely across states. Some states, such as New York and Connecticut, require a master’s degree on top of a strong subject matter degree for full professional (standard) certification, and these requirements generally incorporate 40 credits of professional educational coursework and a lengthy supervised practicum in addition to subject matter preparation. Meanwhile, others, like Louisiana, do not even require a minor in the field to be taught and specify few education coursework or clinical training demands. During the 1980’s, New Jersey, Virginia, and Texas placed a ceiling on professional education coursework of no more than 18 credits at the undergraduate level, without requiring a master’s degree or intensive internship experience to compensate for the reductions in professional preparation. Furthermore, states differ substantially in entry requirements to teacher education. **Thus alternate route candidates in “high standards” states are subject to higher selection standards and receive a substantially more rigorous professional preparation than either “regular” or “alternative” certification candidates in “low standards” states.** This variability means that it is difficult to generalize about teachers’

qualifications in a national sample based on certification status alone. (Darling-Hammond, Berry, and Thoreson, 2001, emphasis added).

The California teacher intern program is an alternative certification program in a high standards state. Thus, by Professor Darling-Hammond's reasoning, the California internship certificate would seem to be comparable to full certification in low standards states. Darling-Hammond has singled out Texas as a state with a low bar for teacher licensing, hence not comparable to high standards states. Yet as noted above, Darling Hammond cites studies of Texas as evidence of the harm done to California students by substandard licensing (Fuller, 1998, 2000).

In sum, given the obvious wide variation across states in the standards for training and licensing teachers and the ways that states have changed those standards over time, Professor Darling-Hammond cannot demonstrate that studies of certification in other states and in prior decades support the remedy she proposes.

#### **V. CALIFORNIA TEACHER PAY IS COMPETITIVE.**

Contrary to Professor Darling-Hammond's claims, average teacher salaries in California are among the highest in the U.S. The most recent data reported by the U.S. Department of Education shows the average California public school teacher salary in 2000-2001 is \$48,923, or the 6<sup>th</sup> highest in the U.S. (Chart 6). In addition to salaries, the average benefit paid to California teachers (as a percent of salaries) is roughly at the median of U.S. states (Chart 7). Thus, on the face of it, California teacher pay and benefits seem adequate, at least by national standards.

Professor Darling-Hammond believes otherwise, and asserts that the California public schools pay "...non-competitive teacher salaries that are substantially unequal across districts." Let us begin with the general level of salaries. Darling-Hammond cites two sources of data. In Figure 5 of her report she compares beginning teacher salaries with beginning teacher salaries in the U.S. and with what are reported as starting teacher salaries for new college graduates. All of these data are collected and all adjustments for "cost-of-living" are made by the research department of the American Federation of Teachers.

In Figure 5 of her report, Darling-Hammond shows the average beginning teacher salary \$26,225 in California "adjusted for the cost of living" as below the U.S. average for beginning teachers (\$27,989) and all of the other starting salaries for college graduates. She arrives at this conclusion by using a state cost-of-living index constructed by Howard Nelson, a researcher at the American Federation of Teachers (Nelson, 1991). However, this AFT cost-of-living index is flawed.

National cost-of-living data are collected by the Bureau of Labor Statistics (BLS) of the U.S. Department of Labor. Unlike the AFT's index, the BLS does not report city-by-city or regional cross-section "cost of living" estimates. The reason is that there are many factors that make it difficult to compare the cost of living across communities.

The AFT “cost of living” index used in the AFT teacher salary report is constructed by the author of that report, Howard Nelson (Nelson, 1982). Nelson regresses metropolitan cost-of-living indexes constructed and marketed by a private research association (American Chamber of Commerce Researcher’s Association, ACCRA) on a variety of variables, including median housing prices. Nelson then takes the coefficients from this regression and predicts state-level cost of living measures. These are what are reported in the AFT report and used by Professor Darling-Hammond to compute “adjusted” starting salaries for California teachers.

However, Nelson’s methodology is not well grounded in economic theory. The primary factor driving the variation in state living costs in his model is housing costs. On the face of it, this might seem to be a reasonable procedure. However, housing prices reflect not only costs of materials in a house, but also the location of the house. Suppose that a simple one-room bungalow house sells for \$40,000 in central Missouri, but that the identical house on the beach in Malibu (with an identical lot) sells for \$400,000. Based on this, Nelson’s procedure would tell us that teachers in Malibu should earn ten times the salary as teachers in central Missouri to equalize real salaries. However, the difference in housing costs between the two locations is not due to differences in materials or construction costs; it is due to the very attractive location of the Malibu home. A large research literature in economics finds that housing costs reflect the amenities of the location. (Roback, 1982; Chay and Greenstone, 1998). Using an index of housing costs that reflects such amenities to adjust for variation in the cost-of-living between geographic locations would tend to “over-adjust” pay for workers in locations with attractive amenities (e.g., sunshine, warm weather, attractive scenery, beaches). Indeed, by this same logic, the pay of teachers in central cities should be lower than in the suburbs because housing prices are lower in the former neighborhoods.

A more straightforward way to take account differing geographic opportunity costs by locale is to compare teacher salaries with pay in other occupations. Teachers make decisions to enter or remain in teaching in part on the basis of relative pay comparisons. It may be that by some ad hoc measure of the cost-of-living, most workers in a state are over or under-paid. One might conclude that nearly everyone in Connecticut or Montana is underpaid. However, people choose to live in these states based on many pecuniary and non-pecuniary factors. Given that a teacher has chosen to live in Montana, what will matter is his or her pay in teaching compared to the next best alternative in the local Montana labor market.

In fact, the Bureau of Labor Statistics collects data designed to gauge pay comparability between private, and state and local workers in local labor markets. This program is called the National Compensation Survey (NCS). The NCS provides estimates of hourly pay for a variety of occupations and professions. These hourly pay estimates are arrived at by dividing the annual salaries of workers by scheduled hours of work. These scheduled hours of work do not take account of overtime or work at home.

These hourly pay comparisons are a more accurate way to compare teaching to non-teaching pay as compared to the annual salaries reported by the AFT. The typical teacher has a shorter workday in the office than most other professional employees. On average, teachers report being in the school for fewer than 38 hours per week (Podgursky, 2003). In fact, language limiting required hours at school is common in teacher collective bargaining agreements. For example, in the most recent New York City teachers contract, the contractual workday (excluding a duty-free lunch) was just 5 hours and 30 minutes.

This does not mean that some teachers do not put in longer hours. It does not include hours spent in home preparation. However, a job that permits relatively more work at home is more attractive to many workers (particularly to women with young children) than one that requires a similar amount of work time on site.

The work year for teachers is also much shorter than for other professions. The median number of days of public school is 180. If one adds several more days for parent conferences, professional development, and planning, then the annual work year for teachers is typically less than 185 days. An accountant or lawyer with two weeks of paid vacation and 10 holidays or personal days will work 240 days annually or 30 percent more days per year.

Given the substantial differences in annual on-site hours of work, the best way to compare teacher to non-teacher pay is to compute hourly rates of pay. The BLS reports NCS data for six major labor markets in California: Sacramento-Yolo, LA-Riverside-Orange County, Vistula-Tulare-Porterville, San Francisco-Oakland-San Jose, San Diego, and Salinas. These comparisons are reported in Charts 8 to 13 below. Each of these charts reports the hourly pay exactly as reported by the BLS. We have selected a variety of professional occupational groupings for comparison. Given the sizes of the samples, the BLS does not report the same level of occupational detail in every market. However, we are able to report the following occupations in every market: all blue-collar, all white-collar, registered nurses, police and detectives. As can be seen from these charts, when expressed on an hourly basis, the pay of public school teachers is near the top in every one of these labor markets.

Professor Darling-Hammond also relies on AFT data in Figure 5 (at 56) on non-teacher earnings for new college graduates. The AFT, in turn, takes these data from a report by the National Association of Colleges and Employers (NACE). Several times each year NACE solicits data on salary offers to graduating students from campus recruiters. The AFT compares data from these NACE reports with scheduled starting salaries for teachers.

I consider these NACE data highly unreliable as a measure of beginning salaries and much inferior to the BLS data I have reported. The NACE data almost certainly yield an upward-biased estimate of non-teacher earnings. First, these data represent salary offers to a very small sample of the total number of college graduates. The 2001-2002 report, for example, was based on only 2600 offers to students in fewer than 120

higher education institutions. More importantly, this sample of offers likely gives a misleading estimate of the immediate post-graduation earnings of all college graduates since only larger businesses or employers (paying higher salaries) are likely to send recruiting teams to campus. Most small colleges do not submit reports to NACE. (National Association of Colleges and Employers, 2002). At a large state flagship institution such as University of Missouri – Columbia, only the Business and Engineering college reports job offers to NACE. Moreover, even for the MU Business school, the number of graduates far exceeds the number of job offers reported by the placement office to NACE. Students who wait tables, drive taxis, and tend bar after college graduation do not appear in NACE data.

We have seen that the relative pay of California teachers is not low, but in fact compares favorably to that of other occupations in California labor markets. In the quote cited above, Darling-Hammond asserts that the pay varies substantially across districts. The BLS data do not permit us to compare relative teacher pay for all 987 school districts in California. However, teacher pay in rural districts is typically lower than in urban districts. This is simply a reflection of lower overall living costs, rural amenities, and alternative salaries in rural labor markets. In Chart 14 we report the relative inequality of teacher salaries using district data from the 1999-2000 Schools and Staffing Surveys (SASS). In the SASS survey, district administrators were asked about teacher salaries at several points on the salary schedule. In this chart, I report scheduled starting pay for a teacher with no experience and a BS/BA and for a teacher with an MA and 20 years experience. I report this for all large states with major metropolitan areas and at least 100 district responses to the SASS.<sup>4</sup>

In Chart 14, I have arrayed the states from low to high in terms of inequality of starting and experienced teacher salaries.<sup>5</sup> California falls in the middle of the distribution for both starting and for MA20 pay.

To summarize, Darling-Hammond made no attempt to isolate the extent to which dispersion in pay between California school districts is explained by cost-of-living or alternative salaries. On average, rural school districts pay lower salaries than urban districts in any state. The pay in rural areas reflects not only the lower costs of living but also the preferences of residents for the amenities associated with small towns in rural locations. Other things being equal this does not mean that rural teachers are of lower quality than urban teachers. In any event, the dispersion of pay across California school

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<sup>4</sup> Some populous states such as Florida or Maryland fail this test because they have fewer than one hundred school districts (48 and 28, respectively). States with fewer school districts are generally going to have less variation in teacher salaries. On the other hand some predominantly rural states such as Montana have many school districts (480) and hence many observations in SASS. But since Montana has no major urban areas, it would be misleading to compare its salary structure with California's.

<sup>5</sup> The measure of inequality used is the variance of the natural log of pay. The value of .089 for starting pay in California means that roughly 65 percent of school districts are within plus or minus nine percent of the state average for starting pay. The variance of the log of pay is preferred to the simple variance of pay in this type of application since it has the property that if all salaries in state A are ten percent higher than in state B, the log variance will be unaffected but the variance will increase.

districts is not obviously out of line with that in other large states with major urban centers.

In short, I find that teacher pay in California compares favorably with pay in non-teaching professions. I find no evidence that teacher salary inequality is out of line with that found in other states with large urban districts.

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Table 1

California STAR Scores and Teacher Certification Rates:  
2001-2002 Grade 5 Math STAR Scores

Coefficient on Teacher Certification Measures  
(absolute t-value in parenthesis)

	Grade 5 Level	Grade 5 Level	Grade 4 – Grade 5 Gain	Grade 5 Level	Grade 5 Level	Grade 4 – Grade 5 Gain
% Grade 5 Teachers without Preliminary or Clear Certification	-.217*** (20.48)	-.038*** (5.54)	.002 (.39)	---	---	---
% Grade 5 with Teachers Emergency Certification	---	---	---	-.217 (14.89)	-.033 (3.53)	.016 (2.20)
Other Control Variables	none	%FRL	%FRL	none	%FRL	%FRL
R-sq	.085	.638	.002	.047	.618	.016
N	4523	4523	4523	4523	4523	4523

Significant at \* (.10), \*\* (.05), \*\*\* (.01) level.

Table 2

California STAR Scores and Teacher Certification Rates:  
2001-2002 Grade 8 STAR Math Scores

Coefficient on Teacher Certification Measures  
(absolute t-value in parenthesis)

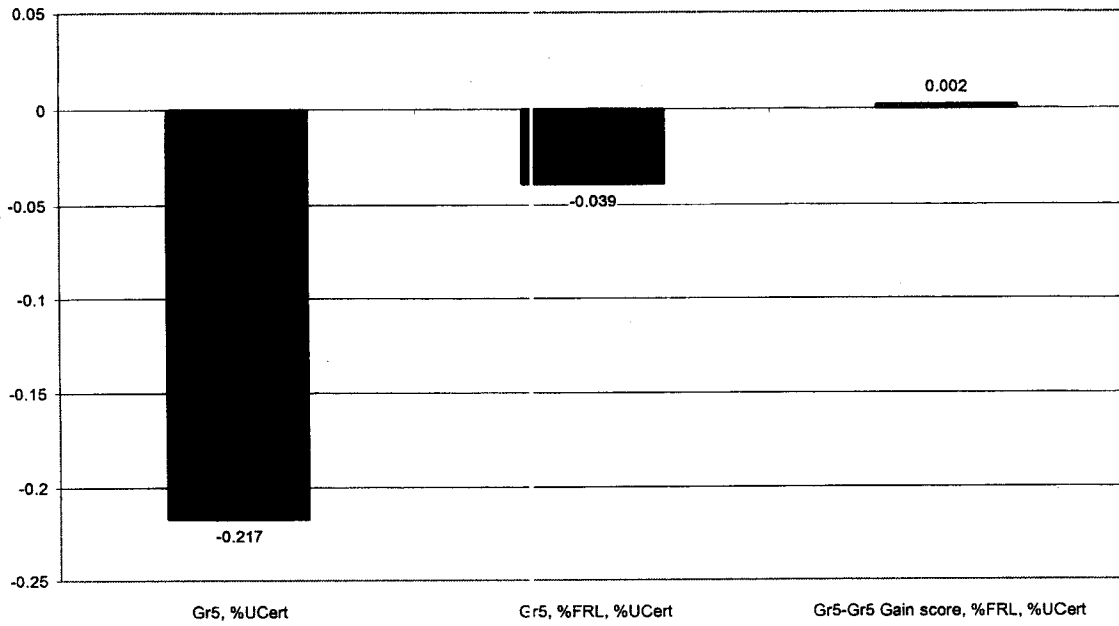
	Grade 8 Level	Grade 8 Level	Grade 7 – Grade 8 Gain	Grade 8 Level	Grade 8 Level	Grade 7 – Grade 8 Gain
% Math Teachers without Clear Certification <sup>a</sup>	-.248*** (14.35)	-.095*** (7.63)	.010* (1.65)	---	---	---
% Math Teachers with Emergency Certification <sup>a</sup>	---	---	---	-.314*** (12.54)	-.128*** (6.17)	.005 (.78)
Other Control Variables	none	%FRL	%FRL	None	%FRL	%FRL
R-sq	.121	.583	.036	.096	.568	.001
N	1488	1488	1488	1488	1488	1488

Significant at \* (.10), \*\* (.05), \*\*\* (.01) level.

a. Mathematics teachers in the school.

Chart 1

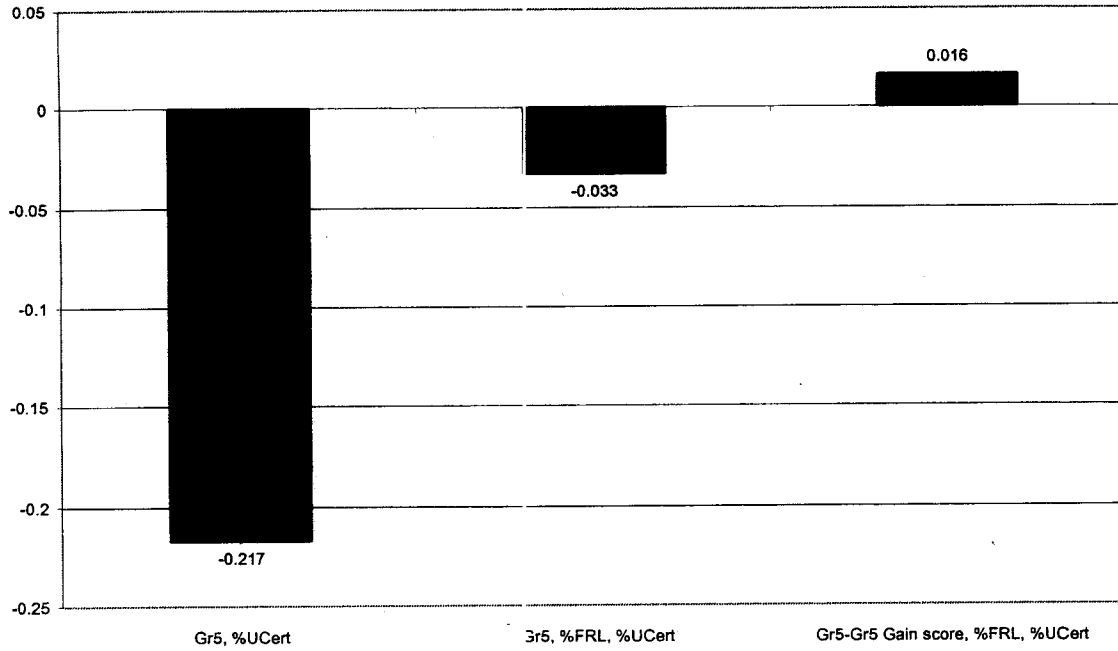
**Percent of Grade 5 Teachers Without Preliminary or  
Clear Certification and Student Achievement:  
Grade 5 Math**



Source: California Department of Education website, <http://star.cde.ca.gov/>

Chart 2

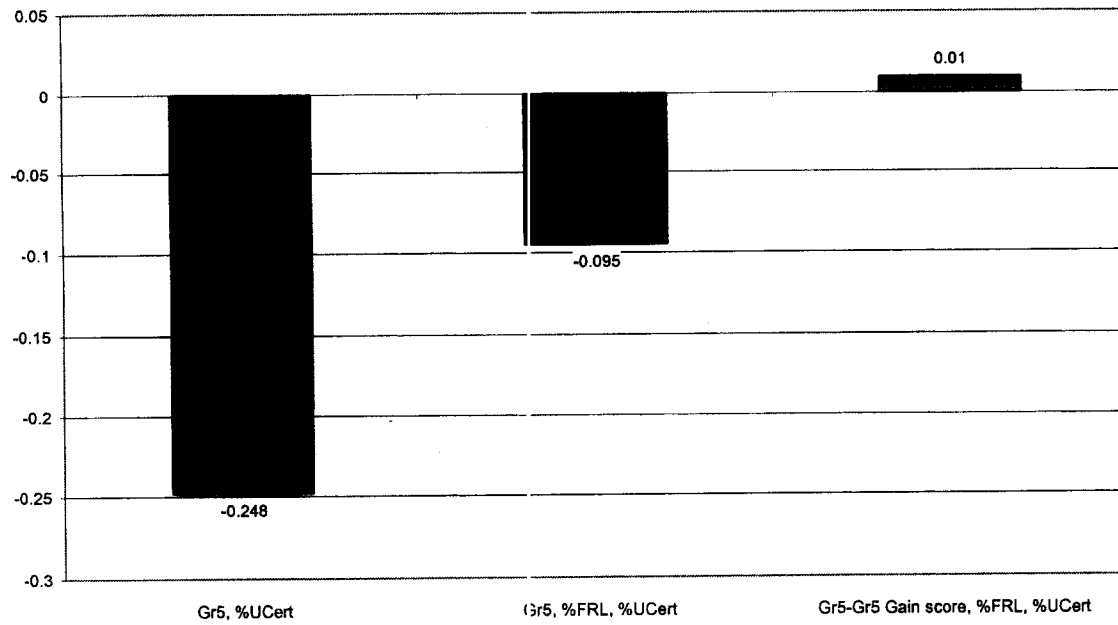
Percent of Grade 5 Teachers with Emergency Certification and Student Achievement:  
Grade 5 Math



Source: California Department of Education website, <http://star.cde.ca.gov/>

Chart 3

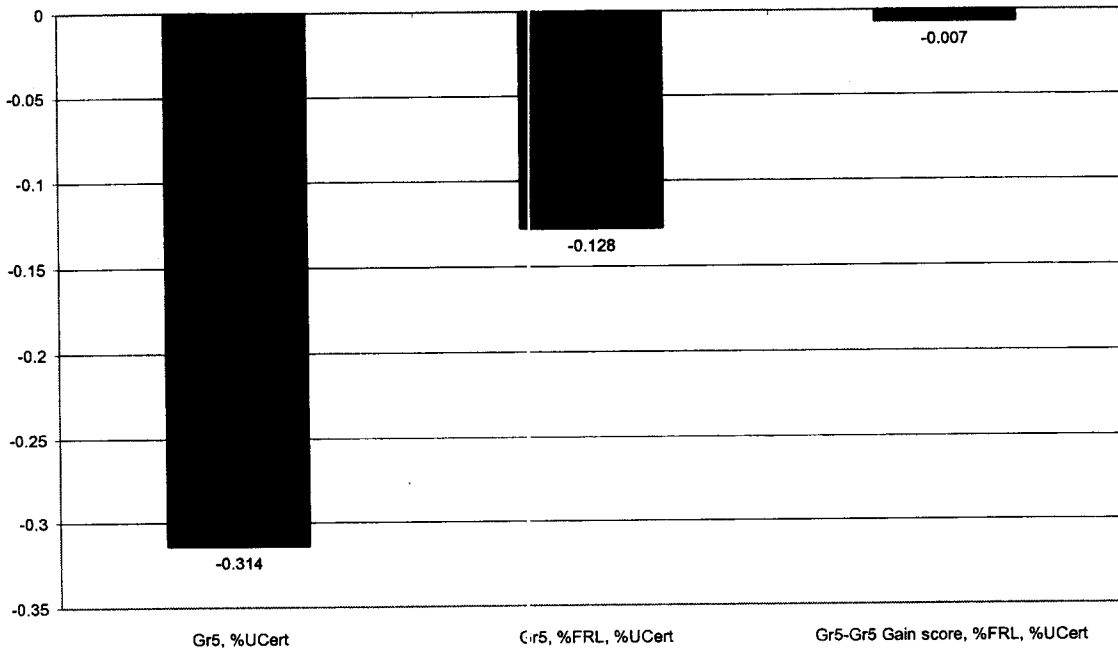
Percent of Grade 8 Teachers Without Preliminary or  
Clear Certification and Student Achievement:  
Grade 8 Math



Source: California Department of Education website, <http://star.cde.ca.gov/>

Chart 4

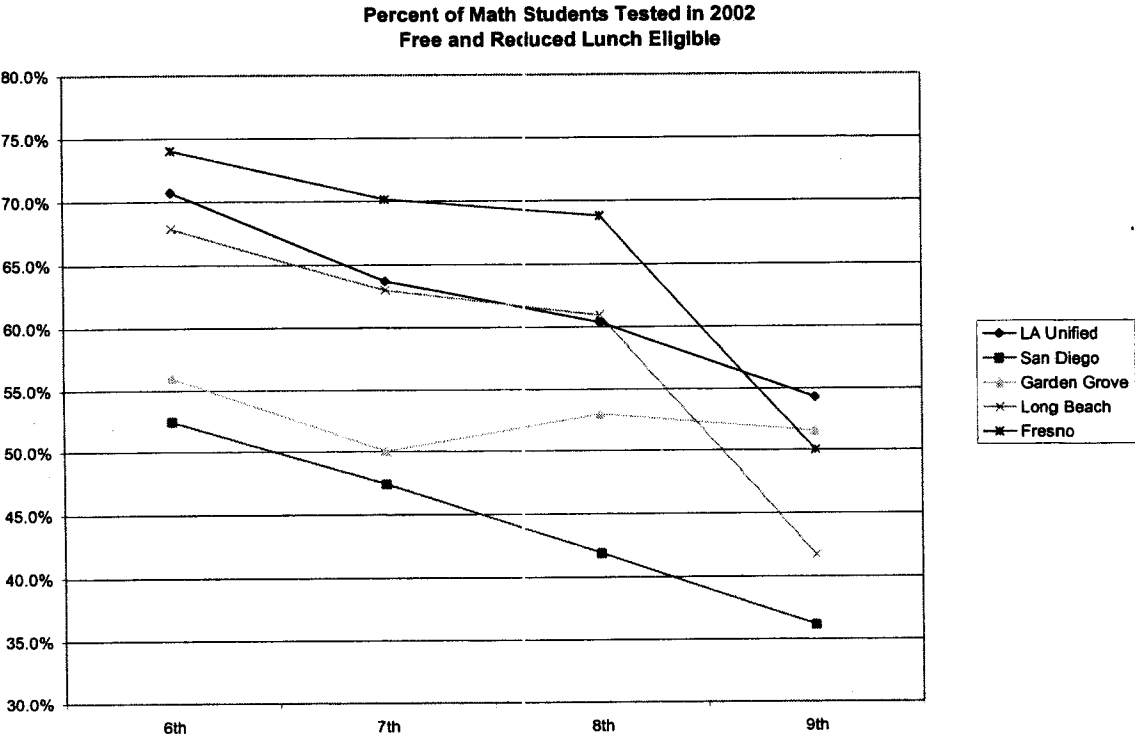
Percent of Grade 8 Teachers With Emergency Certification and Student Achievement:  
Grade 8 Math



Source: California Department of Education website, <http://star.cde.ca.gov/>



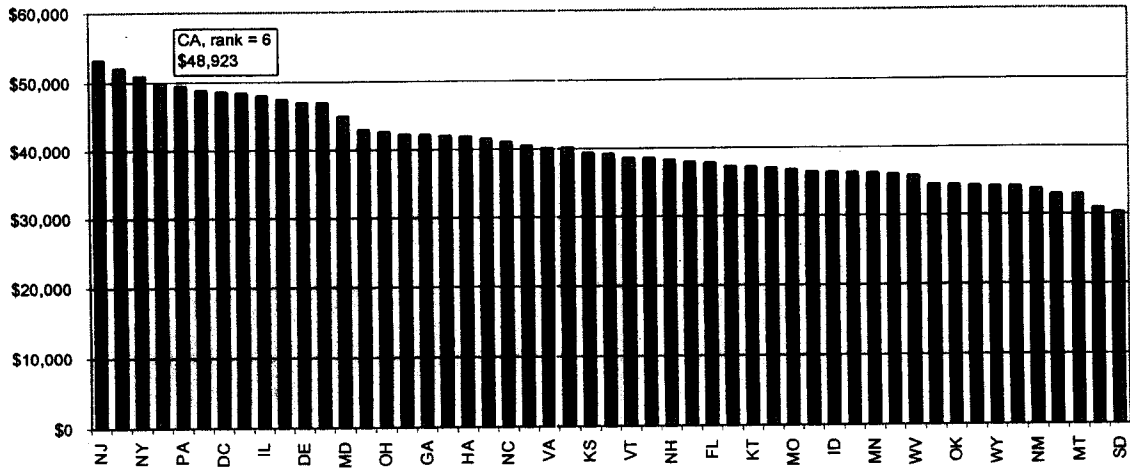
Chart 5



Source: California Department of Education website, <http://star.cde.ca.gov/>

Chart 6

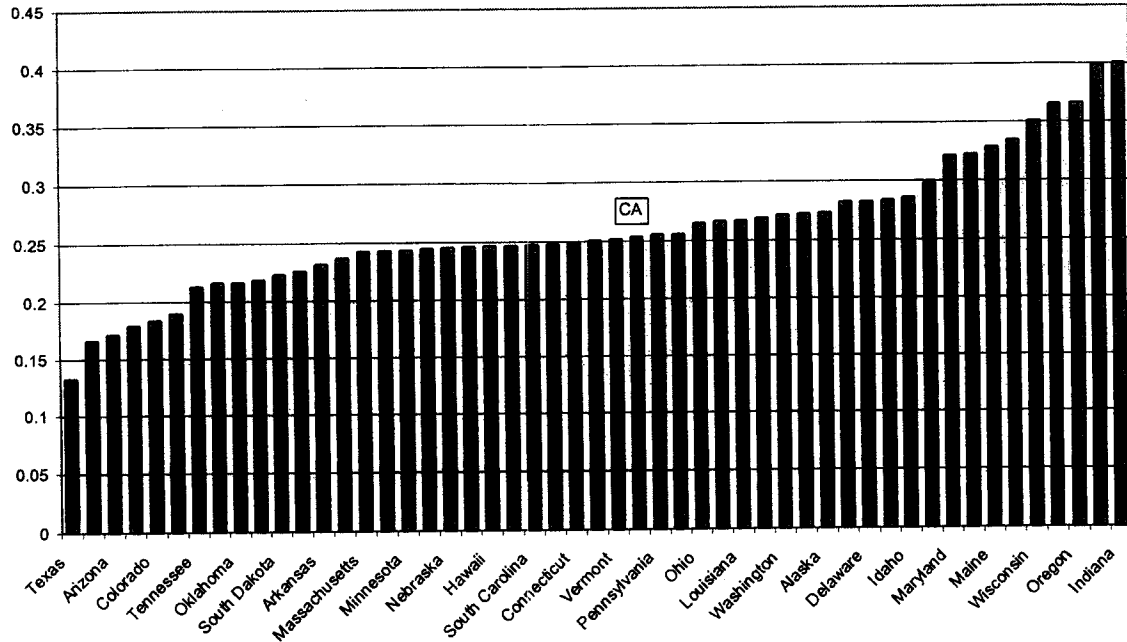
**Average Teacher Salaries  
2000-2001**



Source: U.S. Department of Education. Digest of Education Statistics

Chart 7

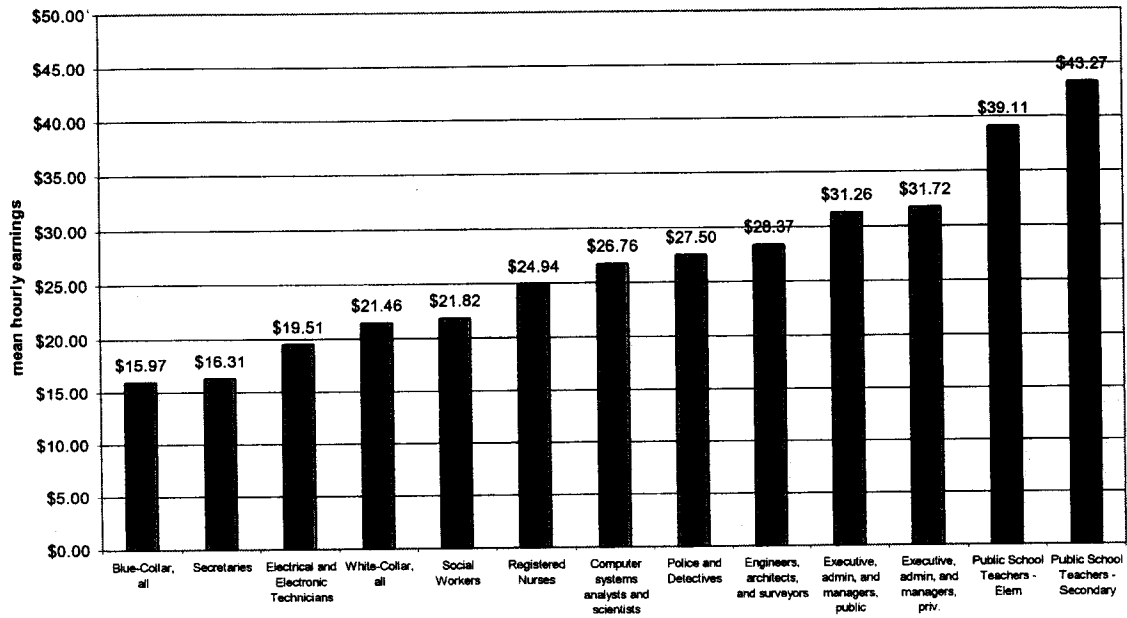
Ratio of Employee Benefits to Salaries by State



Source: U.S. Department of Education, Common Core of Data

Chart 8

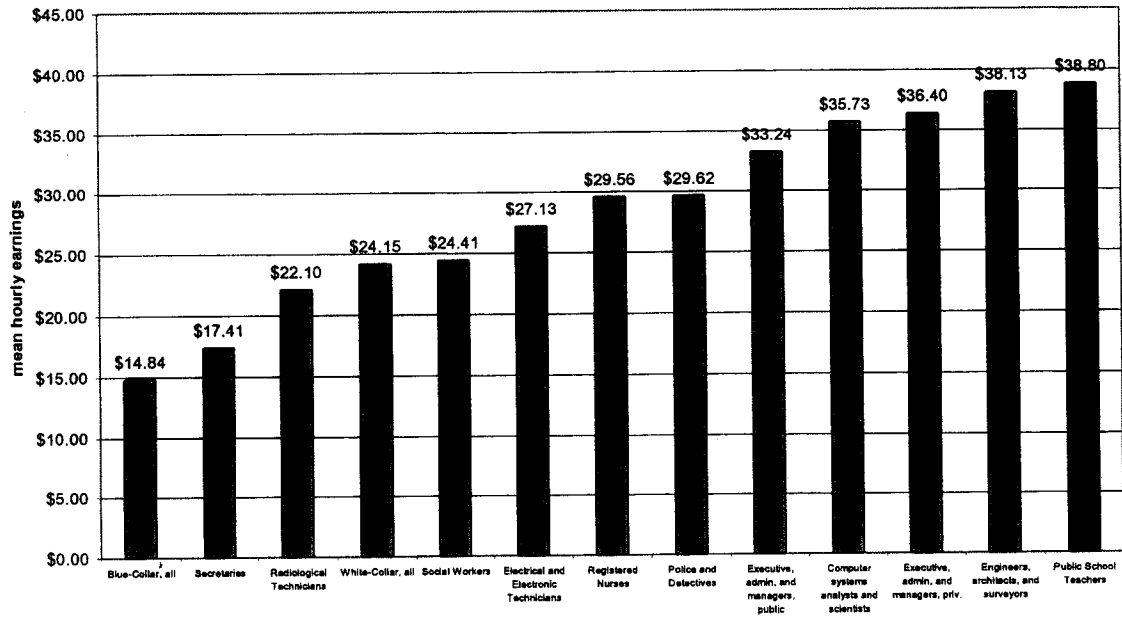
Sacramento -- Yolo, CA Metropolitan Area  
June 2001



Source: U.S. Department of Labor, National Compensation Survey

Chart 9

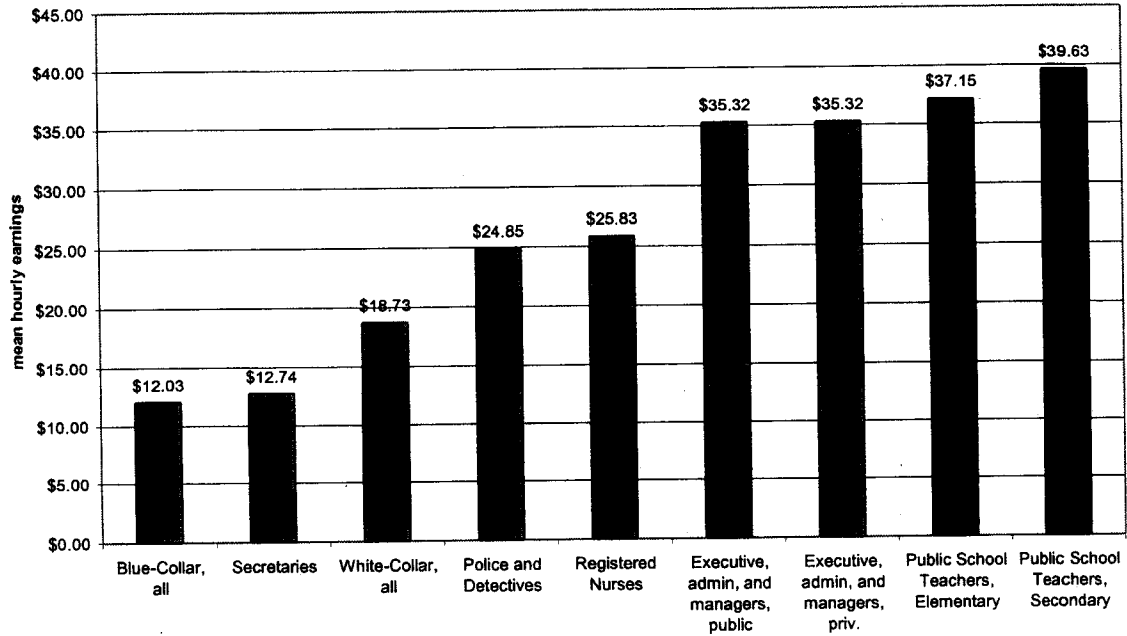
Los Angeles--Riverside--Orange County, CA Metropolitan Area  
October 2001



Source: U.S. Department of Labor, National Compensation Survey

Chart 10

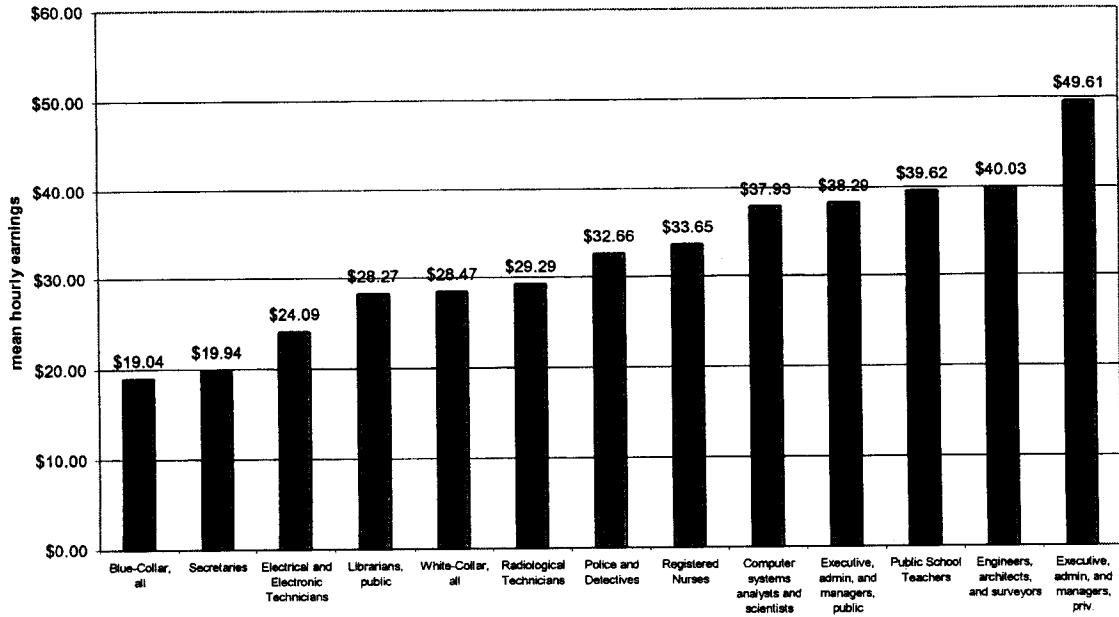
Visalia-Tulare-Porterville, CA Metropolitan Area  
June 2001



Source: U.S. Department of Labor, National Compensation Survey

Chart 11

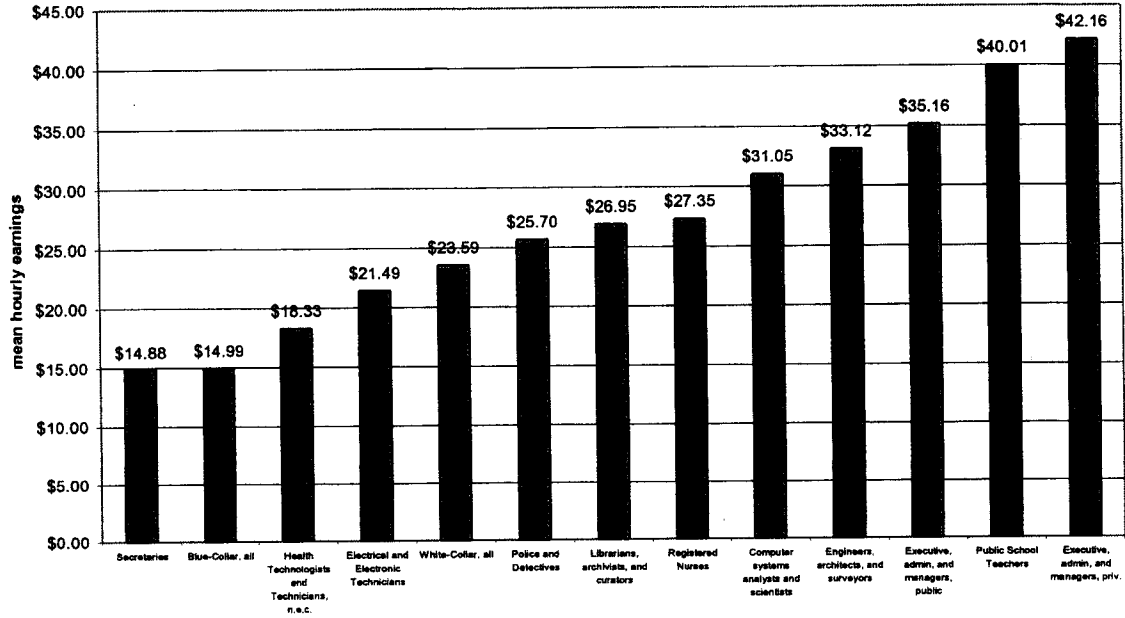
San Francisco–Oakland–San Jose, CA Metropolitan Area  
April 2002



Source: U.S. Department of Labor, National Compensation Survey

Chart 12

San Diego, CA Metropolitan Area  
December 2001

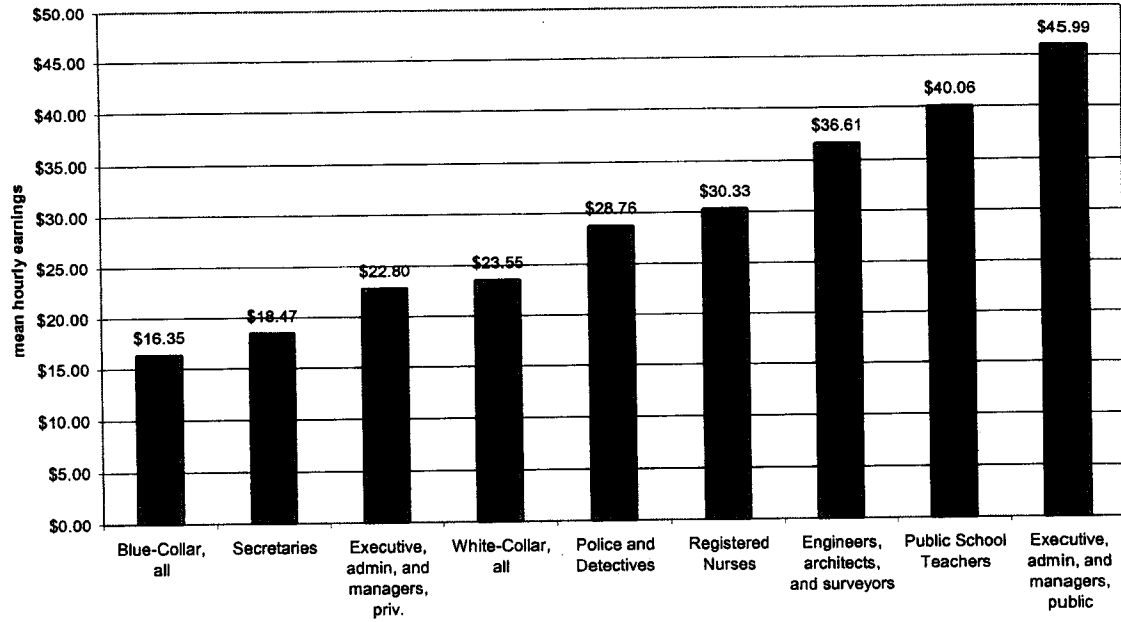


Source: U.S. Department of Labor, National Compensation Survey



Chart 13

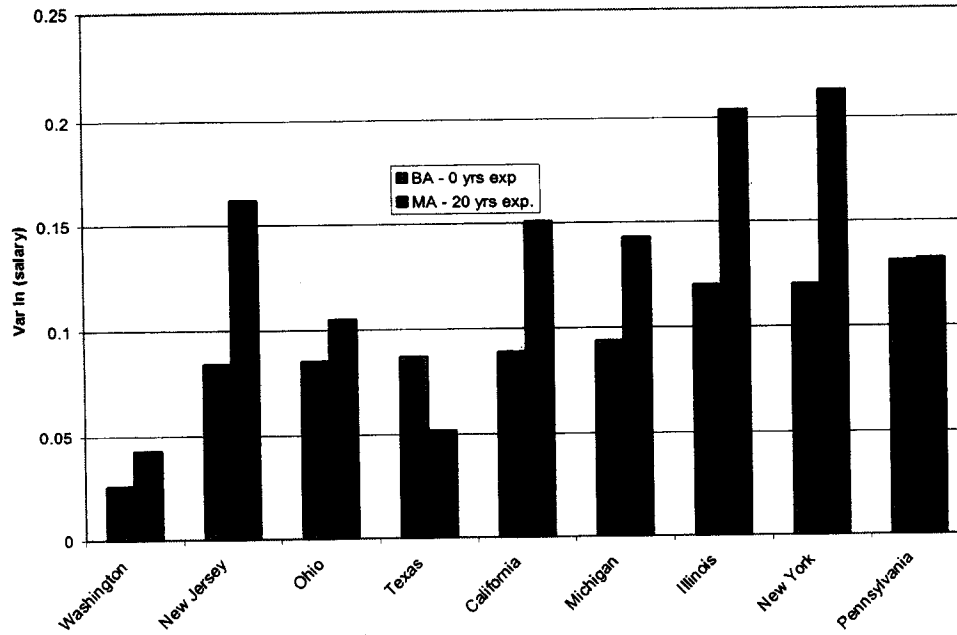
**Salinas, CA Metropolitan Area  
October 2001**



Source: U.S. Department of Labor, National Compensation Survey

Chart 14

Inequality of Starting and MA-20 Years Experience Pay by State



Source: 1999-2000 Schools and Staffing Surveys