



Dr. Linda Darling-Hammond

Nominated by:

Mary B. Herrmann

Biographical Sketch



Dr. Linda Darling-Hammond

***Charles E. Ducommun Professor of Education, Stanford University
Co Director Stanford Center for Opportunity Policy in Education
Co-Director School Redesign Network***

Dr. Linda Darling - Hammond, has dedicated her life's work to the pursuit of excellence and equity for all children. As Dr. Darling-Hammond states so eloquently in her book, *The Right to Learn: A Blueprint for Creating Schools that Work*,

"Bureaucratic solutions to problems of practice will always fail because effective teaching is not routine, students are not passive, and questions of practice are not simple, predictable, or standardized. Consequently, instructional decisions cannot be formulated on high then packaged and handed down to teachers."

Linda Darling-Hammond's contributions to the profession are at the very core of that which is most significant in education; effective teaching and learning. The magnitude of the long-term, sustainable impact of her work is felt at all levels around the world.

Dr. Darling - Hammond has served on over 75 professional committees, boards and organizations internationally and has received more than 60 professional awards. She has published sixteen books and over two hundred monographs, articles and chapters. She resides with her family in Stanford, Ca.

Letter of Nomination

Dr. Linda Darling Hammond

Dear Brock Prize Jurors,

I am honored and privileged to be able to nominate Dr. Linda Darling-Hammond for *The Brock International Prize in Education*. Darling-Hammond is the Charles E. Ducommun Professor of Education at Stanford University, a chief education advisor to President Obama, Co-Director of the Stanford Center for Opportunity Policy in Education, and Founding Director of the School Redesign Network at Stanford.

I believe she is an outstanding candidate for the Brock award because her innovative contributions to the field of education are vast, deep, systemic, and substantive.

Dr. Darling-Hammond's research is highly respected and can be operationalized at every level. Richard Riley, Former U.S. Secretary of Education states the following regarding, Dr. Darling-Hammond and her latest book, *The Flat World and Education: How America's Commitment to Equity Will Determine Our Future*. (Teachers College Press, 2010)

"We are so fortunate that Linda Darling-Hammond has provided this roadmap for educational excellence for all children in today's flat world. She thoughtfully emphasizes the basic strengths that we need in these changing times and then outlines what our schools must do to respond to 21st-century learning needs. Linda is one of the education researchers whom I most respect. 'All children' must mean all children and this book shows us how to do it."

In the book Linda Darling-Hammond asserts that the United States needs to *"establish a purposeful, equitable education system that moves beyond a collection of disparate and shifting reform initiatives, only occasionally related to what we know about teaching and learning, to a thoughtful, well-organized, and well-supported set of policies that will enable all students to learn how to learn, create, and invent the new world they are entering."*

This statement eloquently touches on the vision and extent of influence that epitomizes Dr Darling-Hammond's innovative contributions. Her scholarly research and over two hundred publications are cited regularly at the state and national policy level as well as in college classrooms, and pre-kindergarten through 12th grade professional development sessions around the world.

Her commitment to ensuring excellence and equity for every child is at the heart of her work. According to one of her student's at Stanford, *"Linda Darling-Hammond has the clarity to see the core issues in education by placing the quality of the teacher front and center. She has fundamentally improved teacher education and continues to force policy makers to recognize that the teacher is at the heart of the matter."*

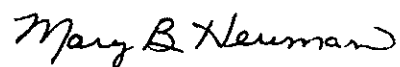
Linda demonstrates a unique ability to champion reform efforts internationally while at the same time touch the lives of the aspiring teachers with whom she works. Another Stanford teacher education student had this to say, *"Linda firmly believes in the capacity of every individual to improve the field of education. Linda once told our class that we had to find our own place where we could leverage our work. She inspired me and made me believe I could make a difference."*

I highly recommend Dr. Linda Darling Hammond for your consideration. In support of her nomination, I have provided the following for your review:

- A brief biographical sketch
- An abbreviated vita
- Two publications:
 - Recognizing and Enhancing Teacher Effectiveness
 - The Flat Earth and Education: How America's Commitment to Equity Will Determine Our Future (Third Annual Brown Lecture in Education Research)

Thank you for your consideration.

Sincerely,



Mary B. Herrmann

Linda Darling-Hammond

Candidate Vita

LINDA DARLING-HAMMOND

Charles E. Ducommun Professor of Education,
Stanford University School of Education
326 CERAS Building, 520 Galvez Mall
Stanford, CA 94305
(650) 723-3555

Education

B.A. (Magna cum laude, with honors), Yale University, 1973

Ed.D. (With highest distinction), Urban Education, Temple University, 1978

Professional Experience

1998 - present

Charles E. Ducommun Professor of Education, Stanford University
Co-Director Stanford Center for Opportunity Policy in Education (2008 -)
Co-Director School Redesign Network (2001 -)
Faculty Sponsor, Stanford Teacher Education Program (1998-2004)

1994 - 2001

Executive Director, National Commission on Teaching and America's Future,
Teachers College, Columbia University

1993 - 1998

William F. Russell Professor in the Foundations of Education, Teachers College,
Columbia University

1989 - 1998

Professor, Teachers College, Columbia University and
Co-Director, National Center for Restructuring Education, Schools, and Teaching,
Teachers College, Columbia University

1985 - 1989

Director and Senior Social Scientist, Education and Human Resources Program,
The RAND Corporation, Washington, D.C.

1979 - 1989

Social Scientist, The RAND Corporation, Washington, D.C.

1978 - 1979

Director, Excellence in Education Program, The National Urban Coalition,
Washington, D.C.

1978 - 1979

Adjunct Assistant Professor, Temple University, Graduate School of Education

1977 - 1978

Senior Research Associate, School Finance Reform Project, The National Urban Coalition, Washington, D.C.

1976 - 1979

Associate Editor, Cross-Reference: A Journal of Public Policy and Multicultural Education

1975 - 1976

Researcher/Consultant, Education Law Center, Philadelphia, Pennsylvania

1974 - 1975

Reading and Study Skills Teacher, Student Resources Center, Temple University, Philadelphia, Pennsylvania

1973 - 1974

English Teacher, Penncrest High School, Media, Pennsylvania

1973 Student Teacher, Camden High School, Camden, New Jersey

1970 - 1973

English Teacher and Curriculum Director, U.S. Grant Foundation, Yale University Afterschool and Summer Program for New Haven Public School Students

1969

Teacher's Aide, Cleveland Public Schools

Honorary Degrees

Honorary Doctorate, Brooklyn College, 2010

Honorary Doctorate of Education, Duquesne University, 2010

Honorary Doctorate of Education, Nanyang Technological University, Singapore, 2009

Honorary Doctor of Letters, Manhattanville College, 2009

Honorary Doctorate, Hong Kong Institute of Education, 2006

Honorary Doctor of Humane Letters, University of Connecticut, 2004

Honorary Doctor of Education, University of Redlands, 2002

Honorary Doctor of Philosophy, University of Oslo, 2000

Honorary Doctor of Humane Letters, Cleveland State University, 1999

Honorary Doctor of Science, University of Toronto, 1997

Honorary Doctorate, Claremont Graduate School, 1994

Honorary Doctor of Humane Letters, Temple University, 1990.

Other Honors and Awards

McGraw Hill Prize for Innovation in Education, 2009

Arne Duncan Award for Educational Equity, Associated Colleges of Illinois, 2009

James T. Kelly Award, National Board for Professional Teaching Standards, 2009

Friend of the NEA Award, National Education Association, 2009

Voices of Conscience Award, Public Advocates, 2009

Miriam Aaron Roland Volunteer Service Prize, Stanford University, 2009

Distinguished Contributions to Research Award, American Educational Research Association, 2009

Distinguished Service Award, National Association of Secondary School Principals, 2009

Education Research Award, Council of Scientific Society of Presidents, 2008

Asa G. Hilliard Award for Outstanding Achievement in Racial Justice and Education Equity, National Summit for Courageous Conversations, 2008

Fellow, American Educational Research Association, for Excellence in Scholarship, 2008

Charles W. Eliot Award for Outstanding Contributions to Education, New England Association of Schools and Colleges, 2007

Margaret B. Lindsey Award for Distinguished Research in Teacher Education, American Association of Colleges for Teacher Education, 2007

Brown Invitational Lecture, American Educational Research Association, 2006

Pomeroy Award for Outstanding Research (with John Bransford, on behalf of the National Academy of Education's Committee on Teacher Education for Preparing Teachers for a Changing World), American Association of Colleges for Teacher Education, 2006

Outstanding Educator Award, Horace Mann League, American Association of School Administrators, 2005

Founder's Award, National Commission on African American Education, 2003

Outstanding Teaching Award, Stanford University School of Education, 2002

Jason Millman Memorial Scholar Award, Consortium for Research on Educational Accountability and Teacher Evaluation, 2002

Exemplary Leader, American Leadership Forum, Silicon Valley, 2001

E. Robert Stevens Award for Outstanding Scholarship, Association of Educational Service Agencies, 2000

Professional Publication Award, California County Superintendents Educational Services Association, 2000

Outstanding Book Award, National Staff Development Council, 2000 (for *Teaching as the Learning Profession: A Handbook of Policy and Practice*)

Research in Practice Award, American Educational Research Association, 2000

Outstanding Teaching Award, Stanford University School of Education, 1999

Outstanding Educator Award, San Francisco Exploratorium, 1999

Contribution to Staff Development Award, National Staff Development Council, 1998

Distinguished Service Award, Council of Chief State School Officers, 1998

Outstanding Book Award, American Educational Research Association, 1998 (for *The Right to Learn: A Blueprint for Creating Schools that Work*)

Distinguished Educator Award, Association of Teacher Educators, 1998

Crystal Apple Award, California Council on the Education of Teachers, 1997

David G. Imig Award for Distinguished Contributions to Public Policy on Behalf of Teacher Education, American Association of Colleges for Teacher Education, 1997

Janet E. Helms Award for Scholarship and Mentoring in Education, Teachers College Roundtable on Cross-Cultural Psychology and Education, Columbia University, 1997

Mark R. Shibles Distinguished Visiting Professor, University of Maine, 1995-96

Kappa Delta Pi, Distinguished Laureate, 1995

Woman of Valor Award, Educational Equity Concepts, 1995

President, American Educational Research Association, 1995-96

"Leaders in Education" Award, Association of Teacher Educators, 1990

National Academy of Education, elected to membership, 1989

Certificate of Honor, Temple University, College of Education, Alumni Association, 1988

P.E.E.R. Recognition (People in Educational Evaluation and Research) Phi Delta Kappa Center on Evaluation, Development, and Research, 1988

QUEST Citation for Outstanding Scholarship, American Federation of Teachers, 1987

Review of Research in Education Award, American Educational Research Association, 1985
Outstanding Alumnus, Temple University, Department of Urban Education, 1984

Phi Delta Kappa George E. Walk Award (awarded annually for most outstanding dissertation in the field of education), 1978

Ed.D, awarded with highest distinction, Temple University, 1978

University Graduate Fellowship Award, Temple University, 1975 - 1977

University Scholarship Award, Yale University, 1969 - 1973

National Merit Scholarship Semifinalist, 1969

Professional Activities

Wallace Foundation, Board of Directors, 2009 - present

Children's Literacy Initiative, Advisory Board, 2009 - present

Stuart Foundation, Education Leadership Advisory Council, 2009 - present

Developmental Studies Center, Advisory Board, 2009 - present

New America Foundation, Federal Education Budget Project Advisory Panel, 2008-present

Alliance for Childhood National Advisory Board, 2008-present

National Council for Educating Black Children, Board of Directors, 2007-present

National Staff Development Council Advisory Panel, 2007-present

Council of Chief State School Officers Formative Assessment Advisory Group, 2006-present

Alliance for Excellent Education, Board member, 2005-present

National Commission on Teaching and America's Future, Board member, 2001-present

Center for Teaching Quality, Board of Directors, 2001-present

Aspire Public Schools Board of Directors, 2001-2007

Co-Chair, National Academy of Education, Committee on Teacher Education, 2000-2005

National Academy of Science, National Research Council Panel on Teacher Testing, 2000-2001

Bay Area Coalition of Essential Schools, Honorary Board, 2000 - present

Foothill College, Center for Innovation, Advisory Board, 2000 - 2002

Co-Chair, California Professional Development Task Force, 2000-01

Aspiring Principals Program, Advisory Board, 2000 - present

George Lucas Education Foundation, Advisory Board, 2000 - 2007

Resource Area for Teachers, Advisory Board, 2000 – present
 Disney Learning Partnership, Advisory Council, 1999 - present
 San Francisco Exploratorium, International Advisory Council, 1998 - 2004
 Technical Review Panel for the Schools and Staffing Survey (SASS), U.S. Department of Education, 1997 - 2000
 Frederick D. Patterson Research Institute Advisory Committee, 1996 – present
 College Board Advisory Committee for Research and Development, 1996 – 2001
 Center for Policy Research in Education, Advisory Board, 1996 - 2000
 National Academy of Education Executive Board, 1995 - 1998
 President, American Educational Research Association, 1995 - 1996; Executive Board, 1994 - 1997
 National Board for Professional Teaching Standards, Member, 1991 - 1997; Executive Committee, 1993 - 1995
 Chair, New York State Curriculum and Assessment Council, 1991 - 1995
 Chair, Council of Chief State School Officers, Interstate New Teacher Assessment and Support Consortium, Standards Drafting Panel, 1991 - 1998
 Carnegie Foundation for the Advancement of Teaching, Board of Trustees, 1995 - 2002
 National Foundation for the Improvement of Education, Board of Directors, 1991–1993; 1995 - 2000
 Recruiting New Teachers, Board of Directors, 1991 - 1998
 The College Board, Equity 2000, Member, National Advisory Commission, 1993 - present
 Carnegie Corporation Task Force on Learning in the Primary Grades, Member, 1994 - 1998
 Spencer Foundation, Member, Board of Directors, 1992 - 1994
 Spencer Postdoctoral Fellowship Committee Member, The National Academy of Education, 1992 - 1994
 Pew Forum on K - 12 Education Reform, Member, 1991 – 2002
 National Education Goals Panel Advisory Committee Resource Group, 1991 - 1993
 Carnegie Commission Task Force on K-12 Mathematics and Science Education, Advisory Council Member, 1991
 National Advisory Board, National Center for Research on Evaluation. Standards, and Student Testing, 1991 - 1995
 Editor, Review of Research in Education, 1991 - 1994
 Center for Collaborative Education, Advisory Board, 1990 - present
 Center on Organization and Restructuring of Schools, National Advisory Panel, 1990 - 1993
 American Association of Colleges for Teacher Education, Committee on the Professional Knowledge Base, 1989 - 1997
 American Federation of Teachers, Education for Democracy, International Board of Sponsors, 1989-1990
 National Board for Professional Teaching Standards, Research and Development Advisory Panel, 1989 - 1991
 Carnegie Corporation, "Our Children's Future" Project, Advisory Panel, 1989 - 1991
 American Educational Research Association, Council Member-at-Large and Executive Board Member, 1988 – 1991
 Edna McConnell Clark Foundation, Advisory Panel, Program for Disadvantaged Youth, 1988 - present
 Institute for Educational Leadership, Program Advisory Committee, 1988-1989
 American Association for the Advancement of Science, Forum for School Science Advisory Board, 1985 - 1988

National Center for the Study of Teacher Education, Advisory Board, 1986 – 1990
Study Group on the National Assessment of Student Achievement, appointed by U.S. Secretary of Education, 1986 - 1987
Commission on Excellence in Teaching, Montgomery County Public Schools, 1985 - 1987
President and Chair, Board of Directors, The Children's Community School of Takoma Park, 1982 - 1983
Advisory Panel, Rockefeller Foundation Research Fellowship Program for Minority Scholars, 1982-1983
Board of Directors, Chicano Education Project, 1981 - 1982

Professional Organization Memberships

National Academy of Education
Executive Board, 1993-1997
Panel on State NAEP Trials
Panel on the Future of Educational Research
Spencer Postdoctoral Fellowship Committee
Panel on the National Education Standards and Improvement Council
Committee on Teacher Education, Co-Chair, 2001- present
Executive Board, 2008-present

American Educational Research Association
President, 1995 - 1996
Executive Board, 1994 - 1997
Nominating Committee, 1991 - present
Minority Fellowship Committee, 1991 - present
Governing Council Member-at-Large, 1988 - 1991
Executive Board, 1989 - 1991
Government and Professional Liaison Committee, 1985 - 1988

Horace Mann League
National Society for the Study of Education
American Education Finance Association
Politics of Education Association
National Urban Education Association

Editorial Boards

International Journal of Educational and Psychological Assessment, 2010-present
Teaching and Learning in Schools and Higher Education, 2007-present
The Teacher Educator, 2005-present
Teacher Education Quarterly, 2005-present
American Educational Research Journal, 2003-2005
The New Educator, 2003-present
Asia-Pacific Journal of Teacher Education and Development, 2003-present
Educational Policy Analysis Archives, 2002-present

Teaching Education, 1999-present
Phi Delta Kappan, 1995-present
Educational Evaluation and Policy Analysis, 1994 – 1999
Teaching and Change, 1993 - present
Harvard Education Letter, 1993 - present
Handbook of Research on Multicultural Education, 1992 - 1994
Review of Research in Education, 1989 - 1991; 1998-2000
American Journal of Education, 1988 - 1990
Educational Researcher, 1987 - 1991; 1998 – 2001

Outside Reviewer

American Educational Research Journal
American Journal of Education
Economics of Education Review
Educational Evaluation and Policy Analysis
Educational Leadership
Educational Policy
Educational Policy Analysis Archives
Educational Researcher
International Journal of Qualitative Studies in Education
Journal of Policy and Management
Journal of Teacher Education
Review of Educational Research
Review of Research in Education
Sociology of Education
Teaching and Change
Teaching and Teacher Education
Teaching Education
Urban Education Review

University Service

Stanford University
 Chair, Teacher Education Steering Committee, 2007-present
 African & African American Studies Steering Committee, 2007-present
 Hass Center Faculty Advisory Board, 2005 - present
 Faculty Sponsor, Stanford Teacher Education Program, 1998 – 2004
 Provost Search Committees, 1999; 2000
 Provost Committee on the Future of the University, 2000-2001

Teachers College, Columbia University
 Faculty Executive Committee, 1990 – 1992; Co-Chair, 1991 - 1992
 Affirmative Action Committee, 1989 – 1991

Publications

Books

The Flat World and Education: How America's Commitment to Equity will Determine our Nation's Future. NY: Teachers College Press, 2009 (in press).

Preparing Principals for a Changing World (with Debra Meyerson, Michelle LaPointe, & Margaret Orr). San Francisco: Jossey-Bass, 2009 (in press).

Powerful Learning: What we Know about Teaching for Understanding (with Brigid Barron, P. David Pearson, Alan H. Schoenfeld, Elizabeth K. Stage, Timothy D. Zimmerman, Gina N. Cervetti, and Jennifer L. Tilson). San Francisco: Jossey-Bass, 2008. Translated into Chinese by East China Normal University Press, 2009.

Powerful Teacher Education: Lessons from Exemplary Programs (in collaboration with Letitia Fickel, Maritza Macdonald, Kay Merseth, Lynne Miller, Gordon Ruscoe, David Silvernail, Jon Snyder, Betty Lou Whitford, Kenneth Zeichner). San Francisco: Jossey-Bass, 2006.

Preparing Teachers for a Changing World: What Teachers Should Learn and Be Able to Do (Editor, with John Bransford). San Francisco: Jossey-Bass, 2005. Recipient of the Pomeroy Award, American Association of Colleges for Teacher Education, 2006.

Instructional Leadership for Systemic Change: The Story of San Diego's Reform (with Amy M. Hightower, Jennifer L. Husbands, Jeannette R. LaFors, Viki M. Young, and Carl Christopher). Lanham, MD: Scarecrow Education Press, 2005.

A Good Teacher in Every Classroom: Preparing the Highly Qualified Teachers Our Children Deserve (Editor, with Joan Snowden). San Francisco: Jossey-Bass, 2005. Excerpted in Educational Horizons, Vol. 85, No. 2, Winter 2007, pp. 111-132.

Learning to Teach for Social Justice (Editor, with Jennifer French and Silvia Paloma Garcia-Lopez). NY: Teachers College Press, 2002.

Teaching as the Learning Profession: A Handbook of Policy and Practice (Editor, with Gary Sykes). San Francisco, CA: Jossey-Bass, 1999. Recipient of the Outstanding Book Award, National Staff Development Council, 2000.

The Right to Learn: A Blueprint for Creating Schools that Work. San Francisco: Jossey-Bass, 1997. Recipient of the Outstanding Book Award, American Educational Research Association, 1998. Spanish translation by Juan M. Escudero Munoz. El Derecho de Aprender: Crear Buenas Escuelas para Todos. Barcelona: Ariel Educacion, 2001.

Authentic Assessment in Action: Studies of Schools and Students at Work (with Jacqueline A. Ancess and Beverly Falk). New York: Teachers College Press, 1995.

A License to Teach: Building a Profession for 21st Century Schools (with Arthur E. Wise and Stephen P. Klein). Boulder, CO: Westview Press, 1995. Reprinted by Jossey Bass, San Francisco, 1999.

Professional Development Schools: Schools for Developing a Profession (Editor). New York: Teachers College Press, 1994. Chinese translation by Wang Xiaohua. Beijing: China Light Industry Press, 2004. 2nd edition by Teachers College Press, 2005.

Review of Research in Education, Volume 20 (Editor). Washington, DC: American Educational Research Association, 1994.

Review of Research in Education, Volume 19 (Editor). Washington, DC: American Educational Research Association, 1993.

The New Handbook of Teacher Evaluation (Editor, with Jason Millman). Newbury Park, CA: Sage Publications, 1990.

Monographs

Oakland Unified School District New Small Schools Initiative Evaluation (with Ash Vasudeva, Stephen P. Newton, & Kenneth Montgomery). Stanford, CA: School Redesign Network at Stanford University, 2009.

Educational Opportunity and Alternative Certification: New Evidence and New Questions. Stanford, CA: Stanford Center for Opportunity Policy in Education, 2009.
http://edpolicy.stanford.edu/pages/pubs/pub_docs/mathematica_policy_brief.pdf

Professional Learning in the Learning Profession: A Status Report on Professional Development in the U.S. and Abroad (with Ruth Chung Wei, Nikole Richardson, Alethea Andree, and Stelios Orphanos). Washington DC: National Staff Development Council and Stanford, CA: School Redesign Network at Stanford University, 2009.

High Schools for Equity: Policy Supports for Student Learning in Communities of Color (with Diane Friedlaender). Stanford, CA: School Redesign Network at Stanford University, 2007.

Recognizing and Enhancing Teacher Effectiveness: A Policy Maker's Guide. Washington, DC: Council for Chief State School Officers, 2007.

Influences of National Board Certification on Teachers' Classroom Assessment Practices (with J. Myron Atkin, Mistilina Sato, and Ruth Chung Wei). Stanford, CA: Stanford University, 2007.

Preparing School Leaders for a Changing World: Lessons from Exemplary Programs (with Michelle LaPointe, Debra Meyerson, Margaret Orr, and Carol Cohen). Stanford, CA: Stanford Educational Leadership Institute, 2007.

Preparing School Leaders for a Changing World: Executive Summary (with Michelle LaPointe, Debra Meyerson, and Margaret Orr). Stanford, CA: Stanford Educational Leadership Institute, 2007.

Preparing School Leaders for a Changing World: Case Studies of Exemplary Programs (with Michelle LaPointe and Debra Meyerson). Stanford, CA: Stanford Educational Leadership Institute, 2007.

Standards, Assessments, and Educational Policy: In Pursuit of Genuine Accountability. Eighth Annual William H. Angoff Memorial Lecture. Princeton, NJ: Educational Testing Service, 2006.

Multiple Measures Approaches to High School Graduation (with Elle Rustique-Forrester and Ray Pecheone). Stanford, CA: The School Redesign Network at Stanford University, 2005. Excerpted in Leadership Information, Vol 6, No. 1 (Winter 2007), pp. 17-21. Olympia, WA: School Information and Research Service.

Building Instructional Quality: "Inside-Out" and "Outside-In" Perspectives on San Diego's School Reform (with Amy M. Hightower, Jennifer L. Husbands, Jeannette R. LaFors, Viki M. Young, & Carl Christopher). Seattle, WA: Center for the Study of Teaching and Policy, University of Washington, 2003.

Wanted: A National Manpower Policy for Education (with Gary Sykes). Denver, CO: Education Commission of the States, 2003. <http://www.ecs.org/clearinghouse/46/34/4634.doc>.

Access to Quality Teaching: An Analysis of Inequality in California's Public Schools. Paper prepared for Williams v. California, 2002. <http://www.mofo.com/decentsschools/expert-reports/darling-hammond-report.pdf>. Also published by UCLA's Institute for Democracy, Education, & Access. Williams Watch Series: Investigating the Claims of Williams v. State of California. Paper wws-rr002-1002. <http://repositories.cdlib.org/idea/wws/wws-rr002-1002>.

A Case of Successful Teaching Policy: Connecticut's Long Term Efforts to Improve Teaching and Learning (with Suzanne Wilson and Barnett Berry). Seattle, WA: Center for the Study of Teaching and Policy, University of Washington, 2001.

Solving the Dilemmas of Teacher Supply, Demand, and Standards: How We Can Ensure a Competent, Caring, and Qualified Teacher for Every Child, NY: National Commission on Teaching and America's Future, 2000.

Educating Teachers for California's Future, Report for the Teacher Education Summit of California College and University Presidents. San Francisco: The James Irvine Foundation, 2000.

Studies of Excellence in Teacher Education (ed.): Preparation in the Undergraduate Years, Washington, D.C.: American Association of Colleges for Teacher Education and NY: National Commission on Teaching and America's Future, 2000.

Studies of Excellence in Teacher Education (ed.): Preparation at the Graduate Level, Washington, D.C.: American Association of Colleges for Teacher Education and NY: National Commission on Teaching and America's Future, 2000.

Studies of Excellence in Teacher Education (ed.): Preparation in a Five-year Program, Washington, D.C.: American Association of Colleges for Teacher Education and NY: National Commission on Teaching and America's Future, 2000.

Teacher Quality and Student Achievement: A Review of State Policy Evidence, Seattle, WA: Center for the Study of Teaching and Policy, University of Washington, 1999.

Professional Development for Teachers: Setting the Stage for Learning from Teaching, Santa Cruz, CA: The Center for the Future of Teaching & Learning, 1999.

Reshaping Teaching Policy, Preparation, and Practice: Influences of the National Board for Professional Teaching Standards, Washington D.C.: American Association of Colleges for Teacher Education, 1999.

Teaching for High Standards: What Policymakers Need to Know and Be Able to Do (with Deborah Loewenberg Ball). Philadelphia, PA: Consortium for Policy Research in Education, University of Pennsylvania, co-published with the National Commission on Teaching and America's Future, 1998.

New Concepts for New Challenges: Professional Development for Teachers of Immigrant Youth (with Josue Gonzalez). Washington, D.C.: Center for Applied Linguistics, 1997.

Rethinking the Allocation of Teaching Resources: Some Lessons from High Performing Schools (with Karen Hawley Miles). Philadelphia: Consortium for Policy Research in Education, Graduate School of Education, University of Pennsylvania, December, 1997.

Doing What Matters Most: Investing in Quality Teaching, New York: National Commission on Teaching and America's Future, Teachers College, Columbia University, November, 1997.

Using Standards & Assessments to Support Student Learning: Alternatives to Grade Retention (with Beverly Falk). New York: National Center for Restructuring Education, Schools, and Teaching, Teachers College, Columbia University, April, 1997.

What Matters Most: Teaching for America's Future, New York: National Commission on Teaching and America's Future, Teachers College, Columbia University, September, 1996.

Education for Democracy, Inaugural Lecture for the William F. Russell Professorship. New York: Teachers College, Columbia University, January 26, 1995. Reprinted in William Ayers and Janel L. Miller (eds.) A Light in Dark Times: Maxine Greene and the Unfinished Conversation, pp. 78-91, New York: Teachers College Press, 1998.

Next steps: Moving Toward Performance-Based Licensing. Washington, DC: Interstate New Teacher Assessment and Support Consortium (INTASC), Council of Chief State School Officers (CCSSO), March 1994.

Graduation by Portfolio at Central Park East Secondary School (with Jacqueline A. Ancess). New York: National Center for Restructuring Education, Schools, and Teaching, Teachers College, Columbia University, 1994.

Authentic Teaching, Learning, and Assessment with New English Learners at International High School (with Jacqueline A. Ancess). New York: National Center for Restructuring Education, Schools, and Teaching, Teachers College, Columbia University, 1994.

The Senior Project: Authentic Assessment at Hodgson Vocational/Technical High School (with Jacqueline A. Ancess). New York: National Center for Restructuring Education, Schools, and Teaching, Teachers College, Columbia University, 1994.

Authentic Assessment and School Development (with Jacqueline A. Ancess). New York: National Center for Restructuring Education, Schools, and Teaching, Teachers College, Columbia University, 1994.

Federal Policy Options for Chapter 1. New York: National Center for Restructuring Education, Schools, and Teaching, Teachers College, Columbia University, 1994.

Creating Learner-Centered Accountability (with Jon Snyder, Jacqueline A. Ancess, Lynne Einbender, A. Lin Goodwin, and Maritza B. MacDonald). New York: National Center for Restructuring Education, Schools, and Teaching, Teachers College, Columbia University, 1993.

The Primary Language Record at P.S. 261: How Assessment Transforms Teaching and Learning (with Beverly Falk). New York: National Center for Restructuring Education, Schools, and Teaching, Teachers College, Columbia University, 1993.

Restructuring in Policy and Practice (with Ann Lieberman and Lynne Miller). New York: National Center for Restructuring Education, Schools, and Teaching, Teachers College, Columbia University, November, 1992.

Standards of Practice for Learner-Centered Schools. New York: National Center for Restructuring Education, Schools, and Teaching, Teachers College, Columbia University, 1992.

Beginning Teacher Performance Evaluation: An Overview of State Policies (with Eileen Sclan). Washington, DC: American Association of Colleges for Teacher Education, 1992.

Achieving Our National Education Goals: How do We Get There from Here? 1991 Elam Lecture. Glassboro State College. EdPress, 1991. Excerpted in The Education Digest, Vol. 57, No. 4, (December 1991), pp. 25-27.

Early Lessons in School Restructuring (with Ann Lieberman and David Zuckerman). New York: National Center for Restructuring Education, Schools, and Teaching, Teachers College, Columbia University, 1991.

Creating Accountability in Big City School Systems (with Carol Ascher). New York: National Center for Restructuring Education, Schools, and Teaching and ERIC Clearinghouse on Urban Education, Teachers College, Columbia University, 1991.

The Teaching Internship: Practical Preparation for a Licensed Profession (with Tamar Gendler and Arthur E. Wise). Santa Monica, CA: RAND Corporation, 1990.

Redesigning Teacher Education: Opening the Door for New Recruits to Science and Mathematics Teaching (with Lisa Hudson and Sheila Nataraj Kirby). Santa Monica, CA: RAND Corporation, 1989.

Pre-College Science and Mathematics Teachers: Supply, Demand, and Quality (with Lisa Hudson). Santa Monica, CA: RAND Corporation, 1989.

Recruiting Mathematics and Science Teachers through Nontraditional Programs (with Neil Carey and Brian Mittman). Santa Monica, CA: RAND Corporation, 1988.

Assessing Teacher Supply and Demand (with Gus Haggstrom and David Grissmer). Santa Monica, CA: RAND Corporation, 1988.

Impacts of Teacher Testing: State Educational Governance Through Standard-Setting (with Arthur E. Wise and Susanna Purnell). Santa Monica, CA: Rand Corporation, 1988.

The Evolution of Teacher Policy (with Barnett Berry). Santa Monica, CA: RAND Corporation, 1988.

Licensing Teachers: Design for a Teaching Profession (with Arthur E. Wise). Santa Monica, CA: RAND Corporation, 1987.

Effective Teacher Selection: From Recruitment to Retention (with Arthur E. Wise and Barnett Berry). Santa Monica, CA: RAND Corporation, 1987. Excerpted in The Education Digest, November 1987.

Effective Teacher Selection: From Recruitment to Retention -- Case Studies (with Arthur E. Wise, David Berliner, Emil Haller, Phillip Schlechty, Barnett Berry, Amy Praskac, and George Noblit). Santa Monica, CA: RAND Corporation, 1987.

Tuition Tax Deductions and Parent School Choice: The Case of Minnesota (with Sheila Nataraj Kirby). Santa Monica, CA: RAND Corporation, 1985.

Public Policy and Private Choice: The Case of Minnesota (with Sheila Nataraj Kirby). Stanford, CA: Stanford University Institute for Research on Educational Finance and Governance, 1985.

Beyond the Commission Reports: The Coming Crisis in Teaching. Santa Monica, CA: RAND Corporation, 1984. Excerpted in Education Digest, February 1985.

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Dr. Linda Darling-Hammond



Samples of Publications:

- *Recognizing and Enhancing Teacher Effectiveness (Dec. 2009)*
- *The Flat Earth and Education: How America's Commitment to Equity will Determine Our Future (Aug/Sept. 2007)*

Recognizing and Enhancing Teacher Effectiveness

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Abstract

Efforts to improve the quality of teaching have begun to focus on ways to assess teacher effectiveness and to create systems of development and rewards that support more effective teaching. Policymakers and practitioners are seeking means to evaluate and recognize teacher effectiveness for the purposes of licensing, hiring, and granting tenure; for providing needed professional development; and for identifying expert teachers who can be recognized and rewarded. Some policy makers are also interested in tying compensation to judgments about teacher effectiveness, either by differentiating wages or by linking such judgments to additional responsibilities that carry additional stipends or salary. This paper draws upon research in outlining the issues associated with various approaches to ascertaining teacher effectiveness, and suggests a framework for policy systems that might prove productive in both identifying and developing more effective teachers and teaching.

Introduction

As nations pay increasing attention to educational outcomes, policymakers have undertaken a wide range of reforms to improve schools, ranging from new standards and tests to redesigned schools, new curricula, and new instructional strategies. One important lesson from these efforts has been the recurrent finding that teachers are the fulcrum that determines whether any school initiative tips toward success or failure. Every aspect of school reform – the creation of more challenging curriculum, the use of ambitious assessments, the implementation of decentralized management, the invention of new model schools and programs – depends on highly-skilled teachers.

Reformers have learned that successful programs or curricula cannot be transported from one school to another where teachers do not know how to use them well. Raising graduation requirements has proved to be of little use where there are not enough qualified teachers prepared to teach more advanced subjects well. Mandates for more math and science courses are badly implemented when there are chronic shortages of teachers prepared to teach these subjects. Course content is diluted and more students fail when teachers are not adequately prepared for the new courses and students they must teach. In the final analysis, there are no policies that can improve schools if the people in them are not armed with the knowledge and skills they need.

Furthermore, teachers need even more sophisticated abilities to teach the growing number of public school students who have fewer educational resources at home, those who are new English language learners, and those who have distinctive learning needs or difficulties. Clearly, meeting the expectation that all students will learn to high standards will require a transformation in the ways in which our education system attracts, prepares, supports, and develops expert teachers who can teach in more powerful ways.

An aspect of this transformation is developing means to evaluate and recognize teacher effectiveness throughout the career, for the purposes of licensing, hiring, and granting tenure; for providing needed professional development; and for recognizing expert teachers who can be recognized and rewarded. A goal of such recognition is to keep talented teachers in the profession and to identify those who can take on roles as mentors, coaches, and teacher leaders who develop curriculum and professional learning opportunities, who redesign schools, and who, in some cases, become principals. Some policymakers are also interested in tying compensation to judgments about teacher effectiveness, either by differentiating wages or by linking such judgments to additional responsibilities that carry additional stipends or salary. An integrated approach connects these goals with a professional development system into a career ladder.

In this paper, I draw on research in outlining the issues associated with various approaches to ascertaining teacher effectiveness, and I suggest a framework for policy systems that might prove productive in both identifying and *developing* more effective teachers and teaching. I draw a distinction between effective teachers and effective teaching that is important to consider if improvement in student learning is the ultimate goal.

Effective Teachers and Teaching

It is important to distinguish between the related but distinct ideas of teacher quality and teaching quality. *Teacher quality* might be thought of as the bundle of personal traits, skills, and understandings an individual brings to teaching, including dispositions to behave in certain ways. The traits desired of a teacher may vary depending on conceptions of and goals for education; thus, it might be more productive to think of teacher *qualitics* that seem associated with what teachers are expected to be and do.

Research on teacher effectiveness, based on teacher ratings and student achievement gains, has found the following qualities important:

(1) strong general intelligence and verbal ability that help teachers organize and explain ideas, as well as to observe and think diagnostically;

(2) strong content knowledge – up to a threshold level that relates to what is to be taught;

(3) knowledge of how to teach others in that area (content pedagogy), in particular how to use hands-on learning techniques (e.g. lab work in science and manipulatives in mathematics) and how to develop higher-order thinking skills.

(4) an understanding of learners and their learning and development—including how to assess and scaffold learning, how to support students who have learning differences or difficulties, and how to support the learning of language and content for those who are not already proficient in the language of instruction.

(4) adaptive expertise that allow teachers to make judgments about what is likely to work in a given context in response to students' needs.

Although less directly studied, most educators would include this list a set of dispositions to support learning for all students, to teach in a fair and unbiased manner, to be willing and able to adapt instruction to help students succeed, to strive to continue to learn and improve, and to be willing and able to collaborate

with other professionals and parents in the service of individual students and the school as a whole.

These qualities, supported by research on teaching, are embodied in the standards adopted by the National Board for Professional Teaching Standards and, at the beginning teacher level, by the states involved in the Interstate New Teacher Assessment and Support Consortium (INTASC), operating under the aegis of the Council of Chief State School Officers (CCSSO). This consortium of more than 30 states has taken a leading role in developing both new teacher standards and assessments and has led to the adoption of new licensing standards in most states. As these standards have been built into licensing and preparation requirements over the last decade, they have provided a means to develop a stronger foundation for effective teaching, making teacher qualifications a stronger predictor of teacher effectiveness.

Teaching quality has to do with strong instruction that enables a wide range of students to learn. Such instruction meets the demands of the discipline, the goals of instruction, and the needs of students in a particular context. Teaching quality is in part a function of teacher quality – teachers' knowledge, skills, and dispositions – but it is also strongly influenced by the context of instruction. Key to considerations of context are "fit" and teaching conditions. A "high-quality" teacher may not be able to offer high quality instruction in a context where there is a mismatch in terms of the demands of the situation and his or her knowledge and skills; for example, an able teacher asked to teach subject matter for which s/he is not prepared may teach poorly; a teacher who is prepared and effective at the high school level may be unable to teach small children; and a teacher who is able to teach high-ability students or affluent students well may be quite unable to teach students who struggle to learn or who do not have the resources at home that the teacher is accustomed to assuming are available. Thus, a high-quality teacher in one circumstance may not be a high-quality teacher for another.

A second major consideration in the quality of teaching has to do with the conditions for instruction. If high-quality teachers lack strong curriculum materials, necessary supplies and equipment, reasonable class sizes, and the opportunity to plan with other teachers to create both appropriate lessons and a coherent curriculum across grades and subject areas, the quality of teaching students experience may be suboptimal, even if the quality of teachers is high. Many conditions of teaching are out of the control of teachers and depend on the administrative and policy systems in which they work.

Strong teacher quality may heighten the probability of strong teaching quality, but does not guarantee it. Initiatives to develop teaching quality must consider not only how to identify, reward, and use teachers' skills and abilities but how to develop teaching contexts that enable good practice on the part of teachers. Hiring knowledgeable teachers but asking them to teach out of field, without high-quality curriculum or materials, and in isolation from their colleagues diminishes teaching quality and student learning. Thus, the policies that construct the teaching context must be addressed along with the qualities and roles of individual teachers.

Means for Identifying Effective Teaching for Policy Purposes

In recent years, there has been growing interest in moving beyond traditional measures of teacher qualifications – for example, a score on a paper-and-pencil test or completion of a preparation program before entry, or years of experience and degrees for in-service teachers – to evaluate teachers' actual performance and effectiveness as the basis for making decisions about hiring, tenure, licensing, compensation, and selection for leadership roles. The recent report of the No Child Left Behind (NCLB) Commission in the United States called for moving beyond the designation of teachers as "highly qualified" to an assessment of "highly effective" teachers based on their students' gains on state tests. Other recent U.S. proposals (for example, the TEACH Act) have suggested incentive pay to attract 'effective' teachers to high need schools and to pay them additional stipends to serve as mentors or master teachers.

Some state and local policymakers have sought to develop career ladders or other compensation plans that take into account various measures of teacher effectiveness for designating teachers for specific roles or rewards. These have included measures like National Board Certification and other performance-based evaluations, indicators like master's degrees and years of experience, and various measures of student learning. In addition, a few states have developed performance-based assessments for beginning teacher licensing as a means of determining effectiveness before teachers receive tenure or a professional license.

This paper reviews three categories of measures: 1) Evidence of teacher performance; 2) evidence of teacher knowledge, skills, and practices associated with student learning; and 3) evidence of student learning, including value-added student achievement test scores. Most career ladder or performance-based compensation plans that have survived to date use a combination of all of these measures, a point to which I return in the final section.

I discuss what is known in each category regarding both the validity of the measures and the influence of using certain measures or approaches on the improvement of teaching practice. The presumption underlying this discussion is that successful policies will seek to develop systems that both *assess* teacher effectiveness in valid ways and help to *develop* more effective teachers at both the individual and collective levels.

Evidence of Teacher Performance

There is growing evidence that some well-designed performance-based assessments of teaching detect aspects of teaching that are significantly related to teacher effectiveness, as measured by student achievement gains. These include standardized *teacher performance assessments* like those used for National Board Certification and for beginning teacher licensure in states like Connecticut and California, as well as *standards-based teacher evaluation systems* used in some local districts. The value of using such assessments is that they can both document broader aspects of teacher effectiveness and can be used to help teachers develop greater effectiveness, as participation in these assessments has been found to

support learning both for teachers who are being evaluated and educators who are trained to serve as evaluators.

Teacher Performance Assessments. A standards-based approach to assessing teachers was initially developed and made systematic through the work of the National Board for Professional Teaching Standards, which developed standards for accomplished teaching in more than 30 teaching areas defined by subject matter and developmental level of students. The Board then developed an assessment of accomplished teaching that assembles evidence of teachers' practice and performance in a portfolio that includes videotapes of teaching, accompanied by commentary, lesson plans, and evidence of student learning. These pieces of evidence are scored by trained raters who are expert in the same teaching field, using rubrics that define critical dimensions of teaching as the basis of the evaluation. Designed to identify experienced accomplished teachers, a number of states and districts, including the ones noted earlier, use National Board Certification as the basis for salary bonuses or other forms of teacher recognition, such as selection as a mentor or lead teacher. California offers a \$20,000 bonus, paid over four years, to Board-certified teachers who teach in high-need schools, which has helped to distribute these accomplished teachers more fairly to students who need them.

A number of recent studies have found that the National Board Certification assessment process identifies teachers who are more effective in raising student achievement than others who have not achieved certification.² Perhaps equally important, many studies have found that teachers' participation in the National Board process supports their professional learning and stimulates changes in their practice. Teachers note that the process of analyzing their own and their students' work in light of standards enhances their abilities to assess student learning and to evaluate the effects of their own actions, while causing them to adopt new practices that are called for in the standards and assessments.³ Teachers report significant improvements in their performance in each area assessed – planning, designing, and delivering instruction, managing the classroom, diagnosing and evaluating student learning, using subject matter knowledge, and participating in a learning community – and observational studies have documented that these changes do indeed occur.⁴

National Board participants often say that they have learned more about teaching from their participation in the assessments than they have learned from any other previous professional development experience.⁵ David Haynes' statement is typical of many:

Completing the portfolio for the Early Adolescence/Generalist Certification was, quite simply, the single most powerful professional development experience of my career. Never before have I thought so deeply about what I do with children, and why I do it. I looked critically at my practice, judging it against a set of high and rigorous standards. Often in daily work, I found myself rethinking my goals, correcting my course, moving in new directions. I am not the same teacher as I was before the assessment, and my experience seems to be typical.⁶

Following on the work of the National Board, a consortium of more than 30 states, working under the auspices of CCSSO, created the INTASC standards for beginning teacher licensing. Most states have now adopted these into their licensing systems. In some states, teacher performance assessments for new teachers, modeled after the National Board assessments, are being used either in teacher education, as a basis for the initial licensing recommendation (CA, OR), or in the teacher induction period, as a basis for moving from a probationary to a professional license (CT).

These assessments require teachers to document their plans and teaching for a unit of instruction, videotape and critique lessons, and collect and evaluate evidence of student learning. Like the National Board assessments, beginning teachers' ratings on the Connecticut BEST assessment have been found to significantly predict their students' value-added achievement on state tests.⁷ This finding is especially significant since the lowest-scoring candidates who do not pass the assessment are not allowed to gain a professional license or gain tenure in Connecticut, so the analysis had to deal with a truncated range that did not include most of those teachers. (Those who do not pass have the opportunity to attempt the assessment, but must pass by their 3rd year in teaching to remain in the profession.) About 10% of candidates in Connecticut do not pass the assessment. A study of predictive validity is currently underway for the Performance Assessment for California Teachers (PACT).

These assessments have also been found to help teachers improve their practice. Connecticut's process of implementing INTASC-based portfolios for beginning teacher licensing involves virtually all educators in the state in the assessment process, either as beginning teachers taking the assessment or as school-based mentors who work with beginners, as assessors who are trained to score the portfolios, or as expert teachers who convene regional support seminars to help candidates learn about the standards. Educators throughout the system develop similar knowledge about teaching and learn how principles of good instruction are applied in classrooms. These processes can have far-reaching effects. By the year 2010, an estimated 80% of elementary teachers, and nearly as many secondary teachers, will have participated in the new assessment system as candidates, support providers, or assessors.⁸

A beginning teacher who participated in the assessment described the power of the process, which requires planning and teaching a unit, and reflecting daily on the day's lesson to consider how it met the needs of each student and what should be changed in the next day's plans. He noted: "Although I was the reflective type anyway, it made me go a step further. I would have to say, okay, this is how I'm going to do it differently. It made more of an impact on my teaching and was more beneficial to me than just one lesson in which you state what you're going to do.... The process makes you think about your teaching and reflect on your teaching. And I think that's necessary to become an effective teacher."

The same learning effects are recorded in research on the similar PACT assessment used in California teacher education programs. The assessment requires student teachers or interns to plan and teach a week-long unit of instruction mapped to the state standards; to reflect daily on the lesson they've just taught and revise plans for the next day; to analyze and provide commentaries of

videotapes of themselves teaching; to collect and analyze evidence of student learning; to reflect on what worked, what didn't and why; and to project what they would do differently in a future set of lessons. Candidates must show how they take into account students' prior knowledge and experiences in their planning. Adaptations for English language learners and for special needs students must be incorporated into plans and instruction. Analyses of student outcomes are part of the evaluation of teaching.

Faculty and supervisors score these portfolios using standardized rubrics in moderated sessions following training, with an audit procedure to calibrate standards. Faculties use the PACT results to revise their curriculum. In addition, both the novice teachers and the scoring participants describe benefits for teacher education and for learning to teach from the assessment and scoring processes. For example:

For me the most valuable thing was the sequencing of the lessons, teaching the lesson, and evaluating what the kids were getting, what the kids weren't getting, and having that be reflected in my next lesson...the 'teach-assess-teach-assess-teach-assess' process. And so you're constantly changing - you may have a plan or a framework that you have together, but knowing that that's flexible and that it has to be flexible, based on what the children learn that day.

– Prospective teacher

This [scoring] experience...has forced me to revisit the question of what really *matters* in the assessment of teachers, which - in turn - means revisiting the question of what really *matters* in the *preparation* of teachers.

– Teacher education faculty member

[The scoring process] forces you to be clear about "good teaching;" what it looks like, sounds like. It enables you to look at your own practice critically, with new eyes.

– Cooperating teacher

As an induction program coordinator, I have a much clearer picture of what credential holders will bring to us and of what they'll be required to do. We can build on this.

– Induction program coordinator

When assessments both predict teacher effectiveness and support individual and institutional learning, they can help to create an engine for stimulating greater teacher effectiveness in the system as a whole. The TEACH Act contains a provision to develop a nationally available beginning teacher performance assessment, based on these models, which could provide a useful measure of effectiveness for new teachers and could leverage stronger accountability and improvement in teacher education.

Standards-Based Evaluations of Teaching. Similarly, standards-based teacher evaluations used by some districts have been found to be significantly related to student achievement gains for teachers and to help teachers improve their practice and effectiveness.⁹ Like the teacher performance assessments described above, these systems for observing teachers' classroom practice are based on professional teaching standards grounded in research on teaching and learning. They use systematic observation protocols to examine teaching along a number of dimensions. All of the career ladder plans noted earlier use such evaluations as part of their systems and many use the same or similar rubrics for observing teaching. The Denver compensation system, which uses such an evaluation system as one of its components, describes the features of its system as including: well-developed rubrics articulating different levels of teacher performance; inter-rater reliability; a fall-to-spring evaluation cycle; and a peer and self-evaluation component.

In a study of three districts using standards-based evaluation systems, researchers found positive correlations between teachers' ratings and their students' gain scores on standardized tests (Milanowski, Kimball, & White, 2004). In the schools and districts studied, assessments of teachers are based on well-articulated standards of practice evaluated through evidence including observations of teaching along with teacher interviews and, sometimes, artifacts such as lesson plans, assignments, and samples of student work.

The Teacher Advancement Program offers one well-developed example of a highly-structured teacher evaluation system that was developed based on the standards of the National Board and INTASC and the assessment rubrics developed in Connecticut and Rochester (NY), among others.¹⁰ In the TAP system of "instructionally-focused accountability," each teacher is evaluated four to six times a year by master / mentor teachers or principals who are trained and certified evaluators using a system that examines designing and planning instruction, the learning environment, classroom instruction, and teacher responsibilities. The training is a rigorous four-day process, and trainers must be certified based on their ability to evaluate teaching accurately and reliably. Teachers also study the rubric and its implications for teaching and learning, look at and evaluate videotaped teaching episodes using the rubric, and engage in practice evaluations. After each observation, the evaluator and teacher meet to discuss the findings and to make a plan for ongoing growth. Like other well-developed career ladder systems, TAP provides ongoing professional development, mentoring, and classroom support to help teachers meet these standards. Teachers in TAP schools report that this system, along with the intensive professional development offered, is substantially responsible for improvements in their practice and the gains in student achievement that have occurred in many TAP schools.¹¹ As described later, data from this extensive teacher evaluation and development system is combined with evidence about school-wide and individual teacher student achievement gains in making judgments about teachers' appointment to specific roles in the career ladder.

The set of studies on standards-based teacher evaluation suggest that the more teachers' classroom activities and behaviors are enabled to reflect professional standards of practice, the more effective they are in supporting student learning – a

finding that would appear to suggest the desirability of focusing on such professional standards in the preparation, professional development, and evaluation of teachers. These kinds of results led Hassell (2002) to conclude in his review of teacher pay systems that tying teachers' advancement and compensation to their knowledge and skills and using evaluation systems that help develop those skills, as these systems do, may ultimately produce more positive change in practice than evaluating teachers based primarily on student test scores.

Standards-based evaluation systems have also been used to evaluate beginning teachers for continuation and tenure and to identify struggling teachers for additional assistance and potential dismissal. The most long-standing evaluation systems that have successfully supported evaluation and personnel actions for both beginning and veteran teachers are those that have used Peer Assistance and Review Programs that rely on highly expert mentor teachers to conduct evaluations and provide assistance to teachers who need it. The systems in Rochester, New York; Cincinnati, Columbus, and Toledo, Ohio; and Seattle, Washington have all been studied and found successful in identifying teachers for continuation and tenure as well as intensive assistance and personnel action (see, e.g. NCTAF, 1996).

Key features of these systems include not only the instruments used for evaluation but also the expertise of the evaluators – skilled teachers in the same subject areas and school levels who have released time to serve as mentors to support their fellow teachers – and the system of due process and review that involve a panel of both teachers and administrators in making recommendations about personnel decisions based on the evidence presented to them from the evaluations.

In these systems, beginning teachers have been found to stay in teaching at higher rates because of the mentoring they receive, and those who leave (generally under 5%) are usually those the district has chosen not to continue rather than those who have quit. Among veteran teachers identified for assistance and review (usually 1-3% of the teaching force), generally about half improve sufficiently with intensive mentoring to be removed from intervention status and about half leave by choice or by district request. Because teacher associations have been closely involved in designing and administering these programs in collaboration with the district, the union does not bring grievances when a teacher is discontinued.

Evidence about Teachers' Knowledge, Skills, and Practices

For a variety of reasons, it can be important to document and reward in a teacher evaluation and compensation system aspects of teachers' knowledge and skills – as well as their practices – that are associated with student learning. Schools need a mix of knowledge, skills, and abilities among their faculties to inform curriculum decisions and to meet the needs of their students. For example, aside from the knowledge of content and pedagogy teachers generally acquire in their certification area, specialized knowledge about the teaching of English language learners or the teaching of special education students may be highly desirable in many school contexts. Knowledge of the home languages students speak is also essential for communicating with parents as well as students. Proficiency in using

specific educational techniques, such as Reading Recovery or Cognitively Guided Instruction in mathematics, may be important in certain contexts.

The two-fold rationale for knowledge and skills-based compensation is that there should be incentives for teachers to continue to develop their abilities in ways that are important for student success, and there should be encouragement for teachers to use practices that have been found to be effective. As schools seek to offer a more coherent approach to instruction, encouragement for shared practices among teachers is also important. The kinds of knowledge, skills, and practices to be documented and recognized should be those known to be associated with greater individual and organizational effectiveness. As Odden and colleagues note:

Knowledge- and skills-based compensation systems provide a mechanism to link pay to the knowledge and skills (and by extension, performance) desired of teachers....The concept of knowledge- and skills-based pay in education was adapted from the private sector, where it was developed to encourage workers to acquire new, more complex, or employer-specific skills. Knowledge- and skills-based pay was also intended to reinforce an organizational culture that values employee growth and development and to create a clear career path linked to increasing professional competence.¹²

Evidence that particular kinds of knowledge and skills impact student achievement can guide decisions about what should be documented and recognized. For example, there is evidence that a masters degrees in the field to be taught (e.g. mathematics or mathematics education) is associated with greater effectiveness,¹³ as is training in how to work with diverse student populations (training in cultural diversity, teaching limited English proficient students, and teaching students with special needs).¹⁴ In addition, some specific practices, such as the use of formative assessment to provide feedback to students and opportunities for them to revise their work, have been found in many dozens of studies to have large effect sizes on student learning gains.¹⁵ Teachers who teach students specific meta-cognitive strategies for reading, writing, and mathematical problem solving have been found produce increased student learning of complex skills.¹⁶ And so on.

In some systems, teachers receive recognition for demonstrating that they have implemented particular new practices like these associated with school-wide or district-wide goals, such as the use of common literacy practices across classrooms, or the use of formative assessments in planning and modifying instruction, or the implementation of a new system of writing instruction. Where possible, these practices are documented along with evidence of how the changes have affected student participation and learning. The rationale for using these measures of effective teaching practices is that they support teacher development and school-wide change initiatives, and are related to improvements in the conditions for student learning.

Odden and colleagues offer several examples of knowledge- and skills-based evaluation and compensation plans.¹⁷ For example, Coventry, Rhode Island provides stipends for National Board Certification and for teachers to develop their skills in authentic pedagogy, self-reflection, differentiated instruction, and family and community involvement – all of which are strategies that have been linked

through research to student achievement. Douglas County, Colorado offers compensation for completing blocks of courses associated with district-goals, such as assessment or teaching diverse learners. Vaughan Learning Center, a charter school in Los Angeles, California, offers compensation for relevant degrees and certification, as well as for specific knowledge and skills relevant to the school's mission, such as literacy training, training for teaching English as a second language, special education inclusion, and technology.

Teacher proficiencies can be documented through systematic collection of evidence about planning and instruction, work with parents and students, and contributions to the school. This can be accomplished both through observations of practice, documentation of training or proficiencies, and a portfolio of teacher evidence about practices both in and beyond the classroom. In addition to specific teaching practices, a teacher might document how she increased student attendance or homework completion through regular parent conferences and calls home and show evidence of changes in these student outcomes, as well as other outcomes associated with them, such as improved grades, graduation, and college-going. Odden and colleagues note that a teacher portfolio in such a system "may include artifacts such as scholarly papers in the content area written by the teacher, new curricular the teacher has developed, logs of parental involvement, samples of tests and assignments, lesson plans, and essays reflecting on the teacher's practice."¹⁸

Evidence of Student Learning

Interest in including evidence of student learning in evaluations of teachers has been growing. After all, if student learning is the primary goal of teaching, it appears straightforward that it ought to be taken into account in determining a teachers' competence. At the same time, the literature includes many cautions about the problems of basing teacher evaluations substantially on student test scores. In addition to the fact that curriculum-specific tests that would allow gain score analyses are not typically available in many teaching areas, these include concerns about overemphasis on teaching to the test at the expense of other kinds of learning; problems of attributing student gains to specific teachers; and disincentives for teachers to serve high-need students, for example, those who do not yet speak English and those have special education needs (and whose test scores therefore may not accurately reflect their learning). This could inadvertently reinforce current practices in which inexperienced teachers are disproportionately assigned to the neediest students or schools discourage high-need students from entering or staying. At the same time, some innovative career ladder and compensation programs (in Rochester, New York and Denver, Colorado, for example, as well as the TAP system described earlier) have found valid ways to include evidence of student learning in teacher evaluations. These are discussed below.

The Use of Value-Added Achievement Test Scores to Evaluate Teachers.

Because of a desire to recognize and reward teachers' contributions to student learning, a prominent proposal is to use *value-added student achievement test scores* from state or district standardized tests as a key measure of teachers' effectiveness. The value-added concept is important, as it reflects a desire to

acknowledge teachers' contributions to students' progress, taking into account where students begin. Furthermore, value-added methods are proving valuable for research on the effectiveness of specific populations teachers (for example, those who are National Board Certified or those who have had particular preparation or professional development experiences) and on the outcomes of various curriculum and teaching interventions.

However, there are serious technical and educational challenges associated with using this approach to make strong inferences about *individual* teacher effectiveness, especially for high-stakes purposes, as opposed to studying the effectiveness of *groups* of teachers in a research context. Among other things, for example, when researchers are aggregating data about large groups of teachers for research rather than decision-making purposes, they make various assumptions about how to treat missing student data, which students to include, or how to choose among models using different statistical controls that change the results of their estimates. Researchers may be concerned from an intellectual perspective about whether their models are indeed capturing teacher effects (as opposed to student variables or testing artifacts or the results of school practices outside the classroom), but they need not worry about whether their decisions disadvantage particular teachers in the way they would need to if these analyses were to be used to make individual personnel decisions.

Indeed, the emergent strategies being used to analyze student learning data to assess potential teacher effectiveness produce very different results depending on the different decisions researchers make about how to handle the data (for example, whether or not to control for student demographic characteristics or school effects, whether and how to interpolate missing data for students, whether to include or exclude special needs learners or new English language learners, whether to use tests that do not measure the specific curriculum a teacher teaches). Leading researchers agree that, while it is useful for research purposes, value-added modeling (VAM) is not appropriate as a primary measure for evaluating individual teachers. Summarizing the results of many studies, including a recent wide-ranging review by the RAND Corporation, Henry Braun of the Educational Testing Service concluded:

VAM results should not serve as the sole or principal basis for making consequential decisions about teachers. There are many pitfalls to making causal attributions of teacher effectiveness on the basis of the kinds of data available from typical school districts. We still lack sufficient understanding of how seriously the different technical problems threaten the validity of such interpretations.¹⁹

The career ladder or compensation systems that do use student achievement data include it only as component of a broader system that incorporates evidence from standards-based evaluation systems, teacher performance assessments, or other evidence about teacher qualifications and practices. Often these data come from classroom, school, or district assessments rather than state tests, for reasons discussed further below. These data are

triangulated and interpreted to understand a teachers' practice in a multi-faceted way, rather than using a single measure to draw inferences that may be problematic.

The problems researchers have identified with using value-added testing models as a primary determinant of teacher effectiveness, especially those drawing on once-a-year large-scale assessments, include the following:

Teachers' ratings are affected by differences in the students who are assigned to them. Students are not randomly assigned to teachers – and statistical models cannot fully adjust for the fact that some teachers will have a disproportionate number of students who may be exceptionally difficult to teach (students with poor attendance, who are homeless, who have severe problems at home, etc.) and whose scores on traditional tests are problematic to interpret (e.g. those who have special education needs or who are English language learners). This can create both misestimates of teachers' effectiveness and disincentives for them to want to teach the students who have the greatest needs.

VAM requires scaled tests, which most states don't use. Furthermore, many experts think such tests are less useful than tests that are designed to measure specific curriculum goals. In order to be scaled, tests must evaluate content that is measured along a continuum from year to year. This reduces their ability to measure the breadth of curriculum content in a particular course or grade level. As a result, most states have been moving away from scaled tests and toward tests that measure standards based on specific curriculum content, such as end-of-course tests in high school that evaluate standards more comprehensively (e.g. separate tests in algebra, geometry, algebra 2, and in biology, chemistry, and physics). These curriculum-based tests are more useful for evaluating instruction and guiding teaching, but do not allow value-added modeling. Entire state systems of assessment that have been developed over many years – such as the New York State Regents system and systems in states like California, Washington, Massachusetts, Maine, Connecticut, Kentucky, and many more – would have to be dismantled to institute value-added modeling.

VAM models do not produce stable ratings of teachers. Teachers look very different in their measured effectiveness when different statistical methods are used. Different teachers appear effective depending on whether student characteristics are controlled, whether school effects are controlled, and what kinds of students teachers teach (for example, the proportion of special education students or English language learners). In addition, a given teacher may appear to have differential effectiveness from class to class and from year to year, depending on these things and others. Braun notes that ratings are most unstable at the upper and lower ends of the scale, where many would like to use them to determine high or low levels of effectiveness.

Most teachers and many students are not covered by relevant tests. Scaled annual tests with previous year test results are not available in most states for teachers of science, social studies, foreign language, music, art, physical education, special education, vocational / technical education, and other electives in any grades, or for teachers in grades k-3 and nearly all teachers in grades 9-12. Furthermore,

because the scores are unstable, experts recommend at least 3 years of data for a given teacher to smooth out the variability. With many grades and subjects uncovered by scaled tests, and with three years of data needed to get a reasonably stable estimate for a teacher (thus excluding 1st and 2nd year teachers), at best only about 30% of elementary teachers and 10% of high school teachers would be covered by data bases in most states.

Missing data threatens the validity of results for individual teachers. Once teacher and student mobility are factored in, the number of teachers who can be followed in these models is reduced further. In low-income communities, especially, student mobility rates are often extremely high, with a minority of students stable from one year to the next. Although researchers can make assumptions about score values for missing student data for research purposes, these kinds of adjustments are not appropriate for the purposes of making individual teacher judgments.

Many desired learning outcomes are not covered by the tests that are widely used. Tests in the United States are generally much narrower than assessments used in other high-achieving countries (which feature a much wider variety of more ambitious written, oral, and applied tasks), and scaled tests are narrower than some other kinds of tests. For good or for ill, research finds that high-stakes tests drive the curriculum to a substantial degree. Thus, it is important that measures used to evaluate teacher effectiveness find ways to include the broad range of outcomes valued in schools. Otherwise, teachers will have little incentive to continue to include untested areas such as writing, research, science investigations, social studies, and the arts, or skills such as data collection, analysis, and synthesis, or complex problem solving, which are generally untested.

It is impossible to fully separate out the influences of students' other teachers, as well as school conditions, on their apparent learning. Prior teachers have lasting effects, for good or ill, on students' later learning, and current teachers also interact to produce students' knowledge and skills. For example, the essay writing a student learns through his history teacher may be credited to his English teacher, even if she assigns no writing; the math he learns in his physics class may be credited to his math teacher. Specific skills and topics taught in one year may not be tested until later years. A teacher who works in a well-resourced school with specialist supports may appear to be more effective than one whose students don't receive these supports. A teacher who teaches large classes without adequate textbooks or materials may appear to be less effective than one who has a small class size and plentiful supplies. As Braun notes, "it is always possible to produce estimates of what the model designates as teacher effects. These estimates, however, capture the contributions of a number of factors, those due to teachers being only one of them. So treating estimated teacher effects as accurate indicators of teacher effectiveness is problematic." To understand the influences on student learning, more data about teachers' practices and context are needed.

Thus, while value-added models are useful for looking at groups of teachers for research purposes – for example, to examine the results of preparation or

professional development programs or to look at student progress at the school or district level – and they may provide one measure of teacher effectiveness among several, they are problematic as the primary or sole measure for making evaluation decisions for individual teachers. In the few systems where such measures are used for personnel decisions such as performance pay, they are often used for the entire group of teachers in a school, rather than for individuals. Where they are used, they need to be accompanied by an analysis of the teachers' students and teaching context, and an evaluation of the teachers' practices.

Using Other Evidence of Student Learning. The fact that value-added analysis of test score data in large-scale testing systems is not always appropriate or available as a tool for evaluating individual teachers does not mean that states or districts cannot recognize and reward excellent teachers who produce strong student learning, or create incentives for them to help other teachers and serve the neediest students. It is possible to use other measures of student learning in evaluations of teaching, sometimes pre- and post-tests of learning conducted by districts or schools, or even learning evidence that is assembled by the teacher him or herself. Such evidence can be drawn from classroom assessments and documentation, including pre- and post-test measures of student learning in specific courses or curriculum areas, evidence of student accomplishments in relation to teaching activities, and analysis of standardized test results, where appropriate. The evidence can be assembled in a teaching portfolio by the teacher, demonstrating and explaining the progress of students on a wide range of learning outcomes in ways that take students' starting points and characteristics into account.

In some schools, teachers use their own fall and spring classroom assessments (or pre- and post-unit assessments) as a way of gauging student progress. These measures can also be tailored for the learning goals of specific students (for example, special education students or English language learners.) As part of a portfolio of evidence, these measures can document teacher effectiveness in achieving specific curriculum goals. Measures of student learning in specific subject areas may be scored writing samples or reading samples, mathematics assessments, assessments of science or history knowledge, or even musical performances. These typically provide better measures of classroom learning in a specific course or subject area because they are curriculum-specific and can offer more authentic measures of student learning. They are also more likely to capture the effects of a particular teacher's instruction and be available for most or all students. A teacher might even document the Westinghouse science competition awards she helped students win, or specific break-throughs achieved by her special education students, with evidence of her role in supporting these accomplishments.

In Denver's *Procomp* system,⁹⁰ for example, teachers set two goals annually in collaboration with the principal, and document student progress toward these goals using district, school, or teacher-made assessments to show growth. In Rochester's career ladder, evidence of student learning, determined by the teacher, is assembled in the teachers' portfolio. Arizona's career ladder program – which encourages local districts to design their own systems – requires the use of various methods of student assessment to ascertain teachers' effectiveness.

One study of the Arizona career ladder programs found that, over time, participating teachers demonstrated an increased ability to create locally-developed assessment tools to assess student learning gains in their classrooms; to develop and evaluate pre- and post-tests; to define measurable outcomes in "hard to quantify areas" like art, music, and physical education; and to monitor student learning growth in their action plans. They also showed a greater awareness of the importance of sound curriculum development, more alignment of curriculum with district objectives, and increased focus on higher quality content, skills, and instructional strategies.²¹ Thus, the development and use of student learning evidence seemed to be associated with improvements in practice. In all of these career ladder systems, evidence of student learning is combined with evidence from standards-based teaching evaluations conducted through classroom observation, and evidence of teachers' skills or practices, as described below.

Implications for Policy

Efforts to recognize teacher competence and effectiveness as the basis for personnel decisions are not new in the policy arena, but recent initiatives have provided some potential break-throughs. Efforts to institute versions of merit pay or career ladders in the U.S. have faltered many times before – in the 1920s, the 1950s, and most recently in the 1980s, when 47 states introduced versions of merit pay or career ladders, all of which had failed by the early 1990s.²² The reasons for failure have included faulty evaluation systems, concerns about bias and discrimination, pitfalls of strategies that rewarded individual teachers while undermining collaborative organizational efforts, dysfunctional incentives that caused unintended negative side-effects for serving all children, and lack of public will to continue increased compensation.

The initiatives detailed in this paper demonstrate that systems can provide recognition for demonstrated knowledge, skill, and expertise that move the mission of the school forward and reward excellent teachers for continuing to teach, without abandoning many of the important objectives of the current salary schedule – equitable treatment, incentives for further learning, and objective means for determining pay. Promising beginnings have been made in some states and local districts that have developed new approaches to examining teacher performance and building career ladders. These approaches use multiple measures of performance, typically considering three kinds of evidence in combination with one another:

- (1) Teachers' *performance on teaching assessments* measuring standards known to be associated with student learning (including national assessments, such as National Board Certification, and locally-managed standards-based teacher evaluations);
- (2) Evaluation of *teaching practices* that are associated with desired student outcomes and achievement of school goals, through systematic collection of evidence about teacher planning and instruction, work with parents and students, and school contributions; and
- (3) Contributions to *growth in student learning* (from classroom assessments and documentation as well as standardized tests, when appropriate).

All three of these strategies are used in the Denver, CO Procomp system of teacher compensation based on knowledge, skills, and performance; Rochester's Career in Teaching program; and Minnesota's Alternative Professional Pay System," which were developed in collaboration with local or state teachers associations. Beyond recognizing teachers with new roles or compensation, these systems demonstrate that rewarding teachers for deep knowledge of subjects, additional knowledge in meeting special kinds of student and school needs, and high levels of performance measured against professional teaching standards can encourage teachers to continue to learn needed skills and enhance the expertise available within schools.

State and Local Initiatives

The work that has been done over the last decade to develop and assess teaching standards and to build new models of evaluation and recognition in school districts holds promise for creating more systematic means for developing teacher and teaching quality. Policies for identifying and supporting teacher and teaching effectiveness can be considered for both the beginning of the teaching career – for licensing, hiring, and tenure decisions – and for later stages of teacher development – for compensation and advancement decisions.

Identifying and Developing Beginning Teacher Effectiveness. It is important to be able to make licensing decisions based on greater evidence of teacher competence than merely completing a set of courses or surviving a certain length of time in the classroom. Since the 1980s, the desire for greater confidence in licensing decisions has led to the introduction of teacher licensing tests in nearly all states. However, these tests – generally multiple-choice tests of basic skills and subject matter – are not strongly predictive of teachers' abilities to effectively teach children. Furthermore, in many cases these tests evaluate teacher knowledge *before* they enter or complete teacher education, and hence are an inadequate tool for teacher education accountability. Even paper-and-pencil tests of teaching knowledge, used in a few states, provide little evidence of what teachers can actually *do* in the classroom.

In the coming years, states will be able to benefit from the development of teaching performance assessments that evaluate teachers' practices related to student learning and have been found to be predictive of teachers' effectiveness. States now have the possibility of beginning to examine teacher performance as a basis for granting the initial probationary or later professional license, building on the work that has been done by some states and universities to build reliable and valid assessments that predict teacher effectiveness. Their work demonstrates that on-the-job performance assessments of beginning teachers can be used during teacher education (at the end of an internship or student teaching) as the basis for a licensure recommendation. Systematically scored portfolios including direct evidence of teaching have been developed with state encouragement or requirement by universities in Vermont, Maine, Wisconsin, Oregon, and California. Oregon's teacher Work Sampling System provides pre- and post-test evidence of teachers' contributions to student learning, constructed by teachers themselves.

California's teacher performance assessment, described earlier, which also includes evidence of student learning in relation to a unit of teaching, will be a funded, statewide requirement by 2008.

Some states have also used performance assessments of first or second year teachers (during their probationary period) as the basis for granting a professional license (usually acquired in the 3rd year of practice) and, by implication, setting a clear bar for the tenure decision. Connecticut's system is most highly developed and reliably scored, but initiatives have also been undertaken in North Carolina and California as part of state induction programs.

All of these initiatives have been based on the beginning teacher licensing standards developed by the Interstate New Teacher Assessment and Support Consortium (INTASC), sponsored by the Council of Chief State School Officers. An effort by this consortium to fine-tune and pilot this work more broadly could give momentum to an effort to better evaluate teacher competence and effectiveness at the beginning of the teaching career.

States can also encourage and support localities in developing stronger evaluation of beginning teachers in the early years prior to tenure, tied to effective mentoring from highly accomplished veterans that will help novices meet the standards. Most states now require an induction program of some sort and many also provide some level of funding. However, the activities that are to occur during the induction process and the type of teaching to be developed are often not specified, so programs are frequently less powerful than they could be.

Connecticut wraps its required mentoring of beginning teachers around the teacher performance assessment so that the standards of performance are clear. High-quality local standards-based evaluations, like those described earlier, can also be used for this purpose. Organizing mentoring around clear standards of practice that have been tied to teacher effectiveness focuses the mentor's and novice's efforts on what matters most for teaching success. Of course, this strategy also requires highly-skilled mentors who are themselves effective teachers. This leads to the question of how to identify and select such leaders.

Identifying and Developing Teacher Effectiveness Throughout the Career.

If teachers are better supported and selected for tenure in the early years of the career, the prospects for developing a highly effective teacher corps will be much enhanced. As we have noted, progress has been made in developing career development systems that can recognize excellent teaching and both reward it and tap the knowledge of such teachers on behalf of broader school improvements. These initiatives generally have several features in common. All require teacher participation and buy-in to be implemented. Typically, evaluations occur at several junctures as teachers move from their *initial license*, through a period as a *novice or resident teacher* under the supervision of a mentor, to designation as *professional teacher* after successfully passing an assessment of teaching skills. *Tenure* is a major step tied to a serious decision made after rigorous evaluation of performance in the first several years of teaching, incorporating administrator and peer review by expert colleagues. *Lead teacher status* – which triggers additional compensation and access to differentiated roles – may be determined by advanced certification from the National Board for Professional Teaching Standards and other evidence of

performance through standards-based evaluation systems. Such systems both encourage and measure effective teaching, and can be combined with other evidence of desirable teacher practices and student learning to identify accomplished teachers.

Where this has been done, it has proved critically important to design evaluation systems that provide a comprehensive picture of what teachers do and with what results, to be sure that evaluations are conducted reliably and validly by skilled assessors, and to be confident that evidence about student learning is carefully interpreted and properly attributed to the teacher.

Beyond the features of the evaluation systems, there are important lessons about the features of the policy systems in which they operate. For example, the system should be designed to operate so that teachers are not penalized for teaching the students who have the greatest educational needs. This requires sensitivity to student and classroom characteristics in the evaluation system. Furthermore, incentives should operate to support collegiality by recognizing all the teachers who reach specific criteria, rather than pitting teachers against each other in a situation in which one teacher's gain is another's loss.

The challenges to be overcome in designing productive systems for recognizing and rewarding teacher effectiveness were vividly illustrated by the testimony of an expert veteran teacher in Springfield, Massachusetts last year – a district being asked to put in place a system of merit pay based on value-added student achievement test scores. Springfield is a severely under-resourced district serving a predominantly minority, low-income student population. Fiscal woes had prevented salary increases for three years, and about half of the 2600 teachers in the district had left over this time. Nearly 25% of the teaching force was uncertified and inexperienced.

Susan Saunders, a Springfield native with more than 20 years of experience, was one of the local heroes who had stayed and worked tirelessly to assist the revolving door of beginning teachers, who shared the few updated textbooks with these teachers, and who took on the highest need special education students (comprising more than half of her class of 32 students). When asked how she would feel about working in this new system of test-based merit pay, Saunders said the introduction of the system would force a teacher like herself either to leave or change her approach entirely – to keep the best materials for herself, stop taking on the special education students, and stop helping the other teachers in her building (since one teacher's greater success would come at the expense of another teacher's rating).

The Springfield system was not adopted because an arbitrator deemed the technical validity of the proposed system inadequate to carry the weight of personnel decision making. This example suggests how important it is to exercise care in developing systems of rewards for teachers so they do not create incentives that would discourage teachers from working collaboratively with each other and taking on the most challenging students. Since any measures used are likely to drive instruction, it is also critically important that the assessments used to evaluate student learning cover the broad goals of learning that are valued and are valid for the students whose results would be considered.

State encouragements for local career ladders and innovative compensation systems, like those in Minnesota and Arizona, can be designed to ensure that several important features are in place. These would include:

- (1) Teacher collaboration and buy-in in developing the system;
- (2) Recognition and encouragement of collegial contributions to overall school success and clear criteria for accomplishment that all eligible teachers can achieve, rather than a quota system that pits teachers against each other;
- (3) Valid evidence of teacher effectiveness based on multiple measures, including:

- (3.1) standards-based evaluation of practice, such as National Board Certification, a valid state teacher performance assessment; or local evaluations of teacher performance;

- (3.2) evidence of practice based on multiple classroom observations and examination of other classroom evidence (e.g. lesson plans, student assignments and work samples) by multiple evaluators using a standards-based evaluation instrument that examines planning, instruction, the learning environment, and student assessment.

- (3.3) evidence of learning of the teacher's students on valid assessments that appropriately evaluate the curriculum the teacher teaches;

- (4) Consideration of the needs of the students the teacher serves and valid and appropriate assessment of all students included in the analysis, including students with special learning needs and new English language learners,

- (5) Ongoing, high-quality professional learning opportunities to enable teachers to learn to meet the standards.

Policy Possibilities

Given the challenges to be surmounted in designing and implementing new systems for identifying and recognizing teacher effectiveness, the role of policy should be supportive rather than directive. There are many things to be learned about how to measure teacher effectiveness in ways that are accurate and valid, that create knowledge and incentives for strong collegial work and for teaching all students well. Only a few dozen districts have been able to launch career ladders that have worked and lasted for more than a few years. Any effort to stimulate more productive work in this area should initially provide incentives to state and local initiatives that can garner support and develop models with potential for scale-up.

There are three areas where governmental support could be particularly helpful:

1) To develop and measure beginning teacher effectiveness, fund research and development to make available a beginning teacher performance assessment, along with support for beginning teacher mentoring. Initial teacher competence and effectiveness could be better ascertained, and preparation and mentoring could be strengthened, if they were guided by a high-quality, nationally-available teacher performance assessment, which measures actual teaching skill in the content areas, and which can guide teacher learning and help to develop sophisticated practice as part of licensing and ongoing career advancement.

In the U.S., the Interstate New Teacher Assessment and Support Consortium (INTASC), sponsored by the Council of Chief State School Officers, has already created teacher licensing standards adopted by most states and has piloted performance assessments tied to the standards; several states, including Connecticut and California, have incorporated such performance assessments in the licensing process. As proposed in the TEACH Act, federal support to a consortium of states in concert with appropriate professional associations could further refine and pilot these assessments to provide a useful tool for accountability and improvement that would also facilitate teacher mobility across states by supporting license reciprocity.

Ideally, such a tool would be accompanied by a federally-funded incentive to states and districts to create strong mentoring programs for all beginning teachers. A matching grant program could ensure support for every new teacher in the nation through investments in state and district mentoring programs. Based on the funding model used in California's Beginning Teacher Support and Assessment Program, for example, a federal allocation of \$4000 for each beginning teacher, matched by states and/or local districts, could fund mentoring for every novice teacher (about 125,000 annually)²¹ for an investment of \$500 million a year. If even half of the early career teachers who currently leave teaching were to be retained, the nation would save at least \$600 million a year in replacement costs while gaining more competent teachers.

2) Provide incentive funds for states and localities to develop systems that recognize and tap teacher expertise, and to reward accomplished teachers who take leadership roles in high-need schools. The federal government could encourage districts to develop systems that recognize effective teachers and create career ladders that tap their skills through a competitive grants program. To build teacher effectiveness, such initiatives would incorporate beginning teacher mentoring as well as stages in the career enabling a broader range of roles for expert teachers. They would be accompanied by performance-based teacher evaluation systems that provide information about teacher effectiveness through standards-based teacher evaluations well as systematic collection of evidence about teachers' practices and student learning. Such systems should include evidence of high-quality professional learning opportunities and school designs that provide time for teachers to work and learn together during the school day. They should also be designed to build collaborative incentives and to recognize and support teachers who teach the highest-need students.

A federal initiative could include additional incentives for the design of innovative approaches to attract and keep accomplished teachers in priority low-income schools, through compensation for accomplishment and for additional responsibilities, such as mentoring and coaching. For example, \$500 million would provide \$10,000 in additional compensation for 50,000 teachers annually, to be allocated to expert teachers in high-need schools through state- or locally-designed incentive systems. (Matched by state and local contributions, this program would provide incentives to attract 100,000 accomplished teachers to high-poverty schools.)

Teacher expertise could be recognized through such mechanisms as National Board Certification, state or local standards-based evaluations, and carefully

assembled evidence of contributions to student learning. Incentives might also be structured to encourage such highly effective teachers, as part of a group of teachers, to take on redesigning and reconstituting failing schools so that they become more effective.

3) Support research on value-added modeling and other means for examining student learning growth. Given the interest in using student learning data in evaluations of teachers, and the challenges of doing so, it would be productive for the federal government to fund an impartial group of experts, through the National Academy of Sciences or the National Academy of Education, to examine the data systems and methodologies needed to use student learning data appropriately in systems that assess teaching.

Conclusion

Initiatives to measure and recognize teacher effectiveness appear to be timely, as the press for improved student achievement is joined to an awareness of the importance of teachers in contributing to student learning. Such initiatives will have the greatest pay-off if they are embedded in systems that also develop greater teacher competence through mentoring and coaching around the standards and through roles for teachers to help their colleagues and their schools improve. Initiatives will have a greater likelihood of survival and success if they also build confidence in the validity of the measures and create incentives for teachers to work with colleagues and teach the neediest students. Federal, state, and local partnerships to create increasingly valid measures of teacher effectiveness and to support the development of innovative systems for recognizing and using expert teachers can make a substantial difference in the recruitment and retention of teachers to the places they are most needed and, ultimately, in the learning of students.

Endnotes

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About the Author

Linda Darling-Hammond is Charles E. Ducommun Professor of Education at Stanford University where she has launched the Stanford Center for Opportunity Policy in Education and the School Redesign Network and served as faculty sponsor for the Stanford Teacher Education Program. She is a former president of the American Educational Research Association and member of the National Academy of Education. Her research, teaching, and policy work focus on issues of school reform, teacher quality and educational equity. From 1994-2001, she served as executive director of the National Commission on Teaching and America's Future, a blue-ribbon panel whose 1996 report, *What Matters Most: Teaching for America's Future*, led to sweeping policy changes affecting teaching in the United States. In 2006, this report was named one of the most influential affecting U.S. education and Darling-Hammond was named one of the nation's ten most influential people affecting educational policy over the last decade. She recently served as the leader of President Barack Obama's education policy transition team.

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The Flat Earth and Education: How America's Commitment to Equity Will Determine Our Future

by Linda Darling-Hammond



In the knowledge-based economy that characterizes the 21st century, most previously industrialized countries are making massive investments in education. The United States ranks poorly on many leading indicators, however, primarily because of the great inequality in educational inputs and outcomes between White students and non-Asian "minority" students, who comprise a growing share of the U.S. public school population. Standards-based reforms have been launched throughout the United States with promises of greater equity, but while students are held to common standards—and increasingly experience serious sanctions if they fail to meet them—most states have not equalized funding and access to the key educational resources needed for learning. The result of this collision of new standards with old inequities is less access to education for many students of color, rather than more. This article outlines current disparities in educational access; illustrates the relationships between race, educational resources, and student achievement; and proposes reforms needed to equalize opportunities to learn.

Keywords: competitiveness; equity; inequality; school reform

Throughout two centuries of slavery, a century of court-sanctioned discrimination based on race, and a half century of differential access to education by race, class, language background, and geographical location, we have become accustomed in the United States to educational inequality. While we bemoan the dramatically unequal educational outcomes announced each year in reports focused on the achievement gap, as a nation we often behave as though we were unaware of—or insensitive to—the equally substantial inequalities in access to educational opportunity that occur from preschool through elementary and secondary education, into college and beyond.

Fifty years after *Brown v. Board of Education* (1954), the gaps in educational achievement between White and non-Asian "minority" students remain large, and the differences in access to educational opportunities are growing. Many young people in the United States, especially those who are low-income students of color, do not receive even the minimum education needed to

become literate and join the labor market. This is increasingly problematic, as the knowledge economy we now face demands higher levels of education from all citizens: Today, about 70% of U.S. jobs require specialized skill and training beyond high school, up from only 5% at the turn of the 20th century.

However, although the demands for an educated work force have increased, only about 69% of high school students graduated with a standard diploma in 2000, down from 77% in 1969 (Barton, 2005). Of the 60% of graduates who go on to college, only about half graduate from college with a degree. In the end, less than 30% of an age cohort in the United States gains a college degree (U.S. Census Bureau, 2005). For students of color, the pipeline leaks more profusely at every juncture. Only about 17% of African American young people between the ages of 25 and 29—and only 11% of Hispanic youth—had earned a college degree in 2005, as compared with 34% of White youth in the same age bracket (U.S. Census Bureau, 2005).

Between 1980 and 2000, three times as many African American men were added to the nation's prison systems as were added to our colleges. In 2000, there were an estimated 791,600 African American men in prison or jail, and 603,000 in higher education (Justice Policy Institute, 2005). Most inmates are high school dropouts, and more than half the adult prison population has literacy skills below those required by the labor market (Barton & Coley, 1996). Nearly 40% of adjudicated juvenile delinquents have treatable learning disabilities that were undiagnosed and unaddressed in the schools (Gemignani, 1994).

This is substantially, then, an educational problem associated with inadequate access to the kinds of teachers and other resources that could enable young people to gain the skills to become gainfully employed. Those who are undereducated can no longer access the labor market. While the United States must fill many of its high-tech jobs with individuals educated overseas, a growing share of its own citizens are unemployable and relegated to the welfare or prison systems, representing a drain on the nation's economy and social well-being rather than a contribution to our national welfare. The nation can ill afford to maintain the structural inequalities in access to knowledge and resources that produce persistent and profound barriers to educational opportunity for large numbers of its citizens. Our future will be increasingly determined by our capacity and our will to educate all children well—a challenge we have very little time to meet if the United States is not to enact the modern equivalent of the fall of Rome.

An International Perspective

In 1989, President George H. W. Bush and the 50 governors announced a set of national goals, which included a goal that the United States rank first in the world in mathematics and science by the year 2000. In 2003, the Program in International Student Assessment (PISA) found that U.S. 15-year-olds ranked 28th out of 40 countries in mathematics—on a par with Latvia—and 19th out of 40 countries in science, right after Iceland. As Stage (2005) has noted, PISA looks forward to 21st-century skills, going beyond the question posed by most U.S. standardized tests, “Did students learn what we taught them?” to ask, “What can students do with what they have learned?” PISA defines literacy in mathematics, science, and reading as students’ abilities to *apply* what they know, focused on the kind of learning for transfer that is increasingly emphasized in other nations’ curricula and assessment systems but often discouraged by the multiple-choice tests most U.S. states have adopted under the federal No Child Left Behind Act of 2001 (NCLB).

Most telling is the effect of inequality on U.S. performance. As Figure 1 shows, the distance between the average scale score for Asian and White students, on one hand, and Hispanic and Latino students, on the other, is equal to the distance between the United States’ average and that of the highest scoring countries (Stage, 2005). Furthermore, all groups in the United States do least well on the measures of problem solving. These data suggest two things: First, the United States’ poor standing is substantially a product of unequal access to the kind of intellectually challenging learning measured on these international assessments. Second, in contrast to the rosier picture shown on the National Assessment of Educational Progress (NAEP), which measures less complex application of knowledge, U.S. students in general, and historically underserved groups in particular, may be getting access to scientific information, but they are not getting as much access to the problem-solving and critical thinking skills needed to apply this knowledge in a meaningful way.

Furthermore, as other countries have been pouring resources into education—especially in Asia and Scandinavia—both their achievement and graduation rates have been climbing for all of their students, including recent immigrants and historical minorities. Most of the top-achieving countries now graduate virtually all of their students from high school, and many have created higher education systems that are quickly becoming equally productive. Whereas the United States was an unchallenged 1st in the world in higher education participation for many decades, it has slipped to 13th and college participation for our young people is declining (Douglass, 2006). Just over one third of young adults in the United States are participating in higher education, most in community colleges. Meanwhile, the countries belonging to the Organisation for Economic Cooperation and Development (OECD), which are mostly European, now average nearly 50% participation in higher education, and most of these are in programs leading to a bachelor’s degree. Similarly in Southeast Asia, enormous investments in both K–12 and higher education have steeply raised graduation rates from high school and college-going rates.

The implications of these trends are important for national economies. A recent OECD report found that for every year that the average schooling level of the population is raised, there is a corresponding increase of 3.7% in long-term economic growth

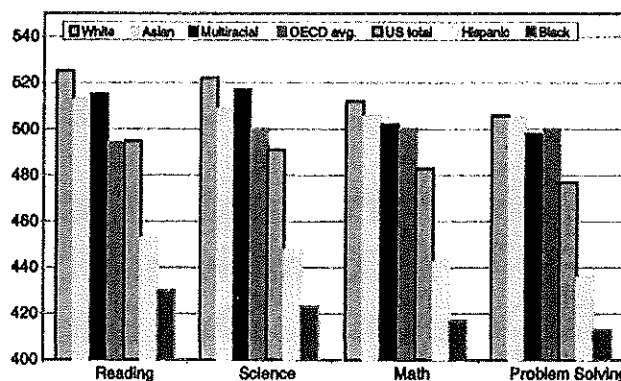


FIGURE 1. U.S. Program in International Student Assessment (PISA) results, by subgroup, compared with Organisation for Economic Cooperation and Development (OECD) average. Data are from OECD PISA 2003, as compiled in Stage (2005). Copyright 2005 by Elizabeth Stage. Reprinted with permission.

(2005), a statistic worth particular note while the United States is going backward in educating its citizens, and most of the rest of the world is moving forward.

The outcomes of these trends are highly visible in my home community in the heart of Silicon Valley, where shortages of individuals adequately trained for the growing number of high-tech science and engineering jobs are a source of grave concern. As just one recent example, on April 4, 2007, a *San Jose Mercury News* headline screamed, “H-1B demand exceeds limit.” The article noted that, on the very first day companies were eligible to apply for these visas for high-tech works, a record 150,000 applications had been filed for the only 65,000 visas available for all of 2008. Anxiety was rampant among technology companies, which would have to undergo a lottery to determine who will receive these visas, designated for engineers, computer programmers, and other technically skilled workers.

Meanwhile, poorly educated California children are dropping out of school in increasing numbers—recent statistics show the graduation rate having declined to about 67% in 2006—and the state’s prisons are bursting at the seams, filled largely with dropouts and functionally illiterate young men who were the victims of the state’s declining investments in education in the years since a tax ceiling caused a drop coupled with growing inequality in school revenues (Oakes, 2004).

International studies continue to confirm that the U.S. educational system not only lags most other industrialized countries in academic achievement by high school, it is also allocates more unequal inputs and produces more unequal outcomes than its peer nations (McKnight et al., 1987). In contrast to European and Asian nations that fund schools centrally and equally, the wealthiest 10% of school districts in the United States spend nearly 10 times more than the poorest 10%, and spending ratios of 3 to 1 are common within states (Educational Testing Service [ETS], 1991; Kozol, 2005). These disparities reinforce the wide inequalities in income among families, with the most resources being spent on children from the wealthiest communities and the fewest on the children of the poor, especially in high-minority communities. This reality creates the wide gaps in educational

Table 1
Percentage Distribution of Public Elementary and Secondary School Students of Each Racial /Ethnic Group, by Percentage Minority of School, Fall 2000

Race/Ethnicity	Total	Less Than 10%	10–24%	25–49%	50–74%	75–89%	90% or More
Total	100	28	19	19	13	8	14
White, non-Hispanic	100	43	26	20	8	2	1
Black, non-Hispanic	100	2	7	19	21	13	37
Hispanic	100	2	7	15	20	19	38
Asian/Pacific Islander	100	7	15	23	22	18	15
American Indian/Alaska Native	100	9	19	27	17	8	20

Note. From National Center for Education Statistics, Common Core of Data (2000–2001).

Table 2
Percentage Distribution of Fourth-Grade Public School Students of Each Racial /Ethnic Group, by Percentage of Students in School Eligible for Free or Reduced-Price Lunch, 2000

Race/Ethnicity	Total	0%	1–5%	6–10%	11–25%	26–50%	51–75%	76–99%	100%
Total	100	6	11	11	14	20	20	11	6
White, non-Hispanic	100	7	14	15	18	23	17	5	1
Black, non-Hispanic	100	2	2	2	7	14	28	32	13
Hispanic	100	4	4	7	9	16	26	16	17
Asian/Pacific Islander	100	7	27	16	9	13	10	17	2
American Indian/Alaska Native	100	3	2	1	9	25	32	16	12

Note. From National Center for Education Statistics, National Assessment of Educational Progress, 2000 Reading Assessment.

outcomes that plague the United States and ultimately weaken the nation.

The Current Legacy of Inequality in U.S. Education

Recurring explanations of educational inequality among pundits, policy makers, and everyday people typically blame children and their families for lack of effort, poor child rearing, a “culture of poverty,” or inadequate genes (see, e.g., Herrnstein & Murray, 1994). The presumption that undergirds much of the conversation is that equal educational opportunity now exists; therefore, continued low levels of achievement on the part of students of color must be intrinsic to them, their families, or their communities.

These assumptions miss an important reality: Educational outcomes for students of color are much more a function of their unequal access to key educational resources, including skilled teachers and quality curriculum, than they are a function of race. Recent analyses of data prepared for school finance cases across the country have found that on every tangible measure—from qualified teachers and class sizes to textbooks, computers, facilities, and curriculum offerings—schools serving large numbers of students of color have significantly fewer resources than schools serving mostly White students (for a review, see Darling-Hammond, 2004). In California, for example, many high-minority schools are so severely overcrowded that they run a multitrack schedule offering a shortened school day and school year, lack basic textbooks and materials, do not offer the courses students would need to be eligible for college, and are staffed by a steady parade of untrained, inexperienced, and temporary teachers (Oakes, 2004).

Such profound inequalities in resource allocations are supported by the increasing resegregation of schools over the decades of the 1980s and 1990s. In 2000, 72% of the nation’s Black students attended predominantly minority schools, up significantly from the low point of 63% in 1980. The proportion of students of color in intensely segregated schools also increased. More than a third of African American and Latino students attended schools with a minority enrollment of 90% to 100%. (See Table 1.) Furthermore, for all groups except Whites, racially segregated schools are almost always schools with high concentrations of poverty (Orfield, 2001). Nearly two thirds of African American and Latino students attend schools where most students are eligible for free or reduced-price lunch. (See Table 2.)

African American and Hispanic American students continue to be concentrated in central city public schools, many of which have become majority “minority” in the past decade while their funding has fallen further behind that of their suburbs. As of 2003, students of color composed 69% of those served by the 100 largest school districts (Sable & Hoffman, 2005). The continuing segregation of neighborhoods and communities intersects with the inequities created by property tax revenues, funding formulas, and school administration practices that create substantial differences in the educational resources made available in communities serving White and minority children. Higher spending districts have smaller classes, higher paid and more experienced teachers, more specialists, and greater instructional resources as well as better facilities; more up-to-date texts, libraries, computers, and equipment; and a wider range of high-quality course offerings. Thus those students most likely to encounter a wide array of educational resources at

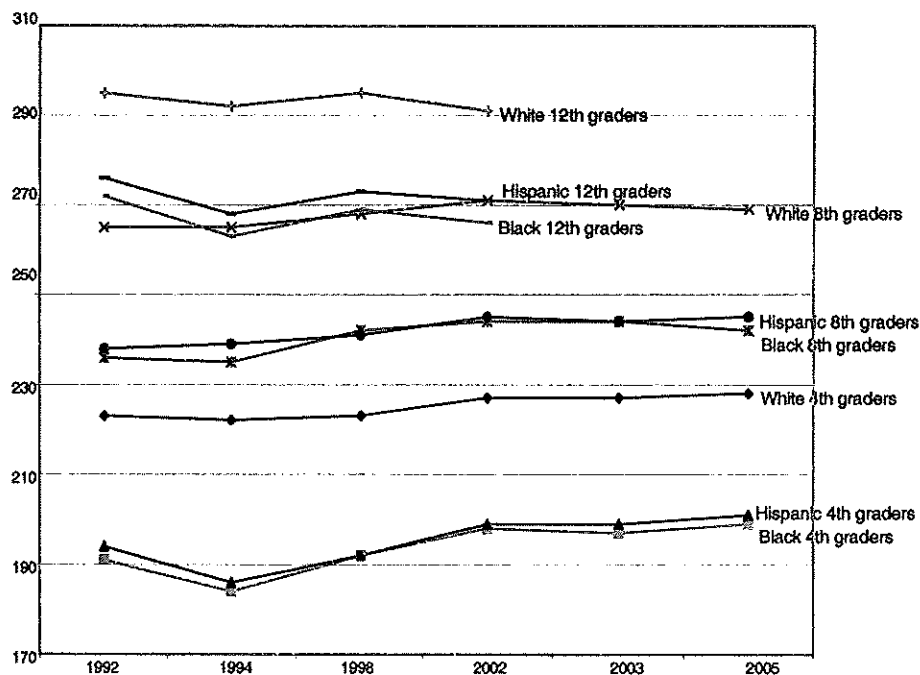


FIGURE 2. Achievement trends in reading. From National Center for Education Statistics, *National Assessment of Educational Progress Trends* (2005).

home are also most likely to encounter them at school (ETS, 1991; Kozol, 2005).

Not only do funding systems and other policies create a situation in which urban districts receive fewer resources than their suburban neighbors, but schools with high concentrations of minority students receive fewer resources than other schools within these districts. And tracking systems exacerbate these inequalities by segregating many minority students within schools, allocating still fewer educational opportunities to them at the classroom level. As I describe below, these compounded inequalities explain much of the achievement gap that is, in fact, as Gloria Ladson-Billings (2006) has noted, an "education debt" owed to those denied access for hundreds of years.

The Achievement Gap

During the years following *Brown v. Board of Education*, when desegregation and early efforts at school finance reform were launched and when the Great Society's War on Poverty increased investments in urban and poor rural schools, substantial gains were made in equalizing both educational inputs and outcomes. Gaps in school spending, access to qualified teachers, and access to higher education were smaller in the mid- to late 1970s than they had been before and, in many states, than they have been since. In the mid-1970s college attendance rates were actually equivalent for a short period of time for White, Black, and Hispanic students.

The gains from the Great Society programs were later pushed back. Most targeted federal programs supporting investments in college access and K-12 schools in urban and poor rural areas were reduced or eliminated in the 1980s. Meanwhile, childhood poverty rates, homelessness, and lack of access to health care also grew. Thus it is no surprise that gaps in achievement began to

widen again after the mid-1980s and have, in many areas, continued to grow in the decades since.

On national assessments in reading, writing, mathematics, and science, Black students' performance continues to lag behind that of White students, with uneven progress in closing the gap. In reading, large gains in Black students' performance throughout the 1970s and 1980s have reversed since 1988, with scores registering declines for 13- and 17-year-olds since then. In 2002, the average Black or Hispanic 12th grader was reading at the level of the average White 8th grader. (See Figure 2.) Scores in writing have also declined for 8th-grade and 11th-grade Black students since 1988. Although there have been some improvements in mathematics and science for 4th and 8th graders, the achievement gap has stayed constant or widened since 1990 (National Center for Education Statistics [NCES], 2005). The lack of progress in closing the gap during the 1990s is not surprising, as the situation in many urban schools deteriorated over the decade. Drops in real per-pupil expenditures accompanied tax cuts and growing enrollments. Meanwhile student needs grew with immigration, concentrated poverty and homelessness, and increased numbers of students requiring second language instruction and special educational services.

Progress in educational attainment, which was substantial after 1950, has also slowed. While White graduation rates were stable at about 80% between 1969 and 2004, graduation rates for Black 18- to 24-year-olds increased rapidly from less than 50% to just over 75% between the 1950s and the early 1980s. However, these rates have been stagnant for the two decades since 1985. In recent years, dropout rates for African Americans have increased from about 13% to 15% (U.S. Bureau of the Census, 2004, Table A-5a). Meanwhile, graduation rates in a number of states have declined as high-stakes testing policies have been implemented, with the strongest decreases for Black and Latino

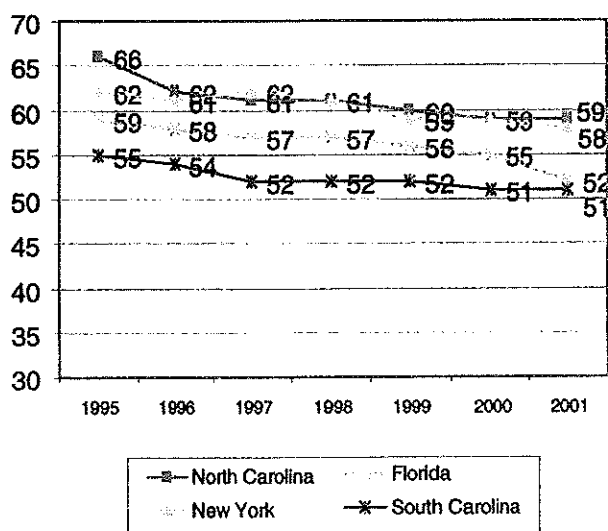


FIGURE 3. State graduation rates, 1995–2001. Data are from National Center for Education Statistics, *Common Core of Data* (2003).

students. Data from the NCES indicate that 4-year graduation rates¹ decreased between 1995 and 2001 in Florida, New York, North Carolina, and South Carolina, where new high-stakes testing policies were introduced. (See Figure 3.) In all of these cases, 4-year graduation rates for African American and Latino students have dropped even more precipitously than graduation rates for Whites, standing at less than 50% now.

With a more educationally demanding economy, the effects of dropping out are more negative than they have ever before been and are much worse for young people of color than for Whites. In 1996, a recent school dropout who was Black had only a 1-in-5 chance of being employed, whereas the odds for his White counterpart were about 50% (NCES, 1998, p. 100). Even recent high school graduates struggle to find jobs. Among African American high school graduates not enrolled in college, only 42% were employed in 1996, as compared to 69% of White graduates (NCES, 1998, p. 100). Those who do not succeed in school are becoming part of a growing underclass, cut off from productive engagement in society.

Because the economy can no longer absorb many unskilled workers at decent wages, lack of education is increasingly linked to crime and welfare dependency. National investments in the past two decades have tipped heavily toward incarceration rather than education. Nationwide, during the 1980s, federal, state, and local expenditures for corrections grew by more than 900%, and for prosecution and legal services by more than 1,000% (Miller, 1997), while prison populations more than doubled (U.S. Bureau of the Census, 1996, p. 219). During the same decade, per-pupil expenditures for schools grew by only about 26% in real dollar terms and much less in cities (NCES, 1994).

The failure of many states to invest adequately in the education of children in central cities, to provide them with qualified teachers and the necessary curriculum and learning materials, results in many leaving school without the skills needed to become a part of the economy. These social choices increasingly undermine America's competitive standing. While the highest achieving nations are making steep investments in education,

especially their higher education systems, the United States is trading off resources for education with spending on prisons. By 2001, state correctional expenditures had grown to \$38.2 billion (up from \$15.6 billion in 1986), a rate of increase nearly double that of higher education spending. By 2005, two states—California and Massachusetts—spent nearly as much on prisons as they spent on higher education. Ultimately, the price of educational inequality is loss of opportunity and progress both for individuals and for the society as a whole.

Structuring Inequality

A number of studies have documented how instructional disparities influence learning and achievement for students of color. For example, when Robert Dreeben (1987) studied reading instruction and outcomes for 300 Black and White first graders across seven schools in the Chicago area, he found that differences in reading outcomes among students were almost entirely explained not by socioeconomic status or race but by the quality of instruction the students received:

Our evidence shows that the level of learning responds strongly to the quality of instruction: having and using enough time, covering a substantial amount of rich curricular material, and matching instruction appropriately to the ability levels of groups. . . . When Black and White children of comparable ability experience the same instruction, they do about equally well, and this is true when the instruction is excellent in quality and when it is inadequate. (p. 34)

However, the study also found that the quality of instruction received by African American students was, on average, much lower than that received by White students, thus creating a racial gap in aggregate achievement at the end of first grade. In fact, the highest ability group in Dreeben's sample at the start of the study was in a school in a low-income African American neighborhood. These students, though, learned less during first grade than did their White counterparts because their teacher was unable to provide the quality instruction that this talented group deserved.

In addition to factors such as class size and school size that influence the personal attention students receive, the combination of teacher quality and curriculum quality accounts for much of the school-related contribution to achievement. The combination of these resources can strongly influence school outcomes. For example, a study of African American high school youth randomly placed in public housing in the Chicago suburbs rather than in the city found that, relative to their comparable city-placed peers, who were of equivalent income and initial academic attainment, the students who were enabled to attend better funded, largely White suburban schools had better educational outcomes across many dimensions: They were substantially more likely to have the opportunity to take challenging courses, receive additional academic help, graduate on time, attend college, and secure good jobs (Kaufman & Rosenbaum, 1992). Much of the difference in school achievement between minority students and others is due to the effects of unequal school opportunities and, in particular, greatly disparate access to high-quality teachers and teaching.

Unequal Access to Qualified Teachers

In many cities, increasing numbers of unqualified teachers have been hired since the late 1980s, when teacher demand began to

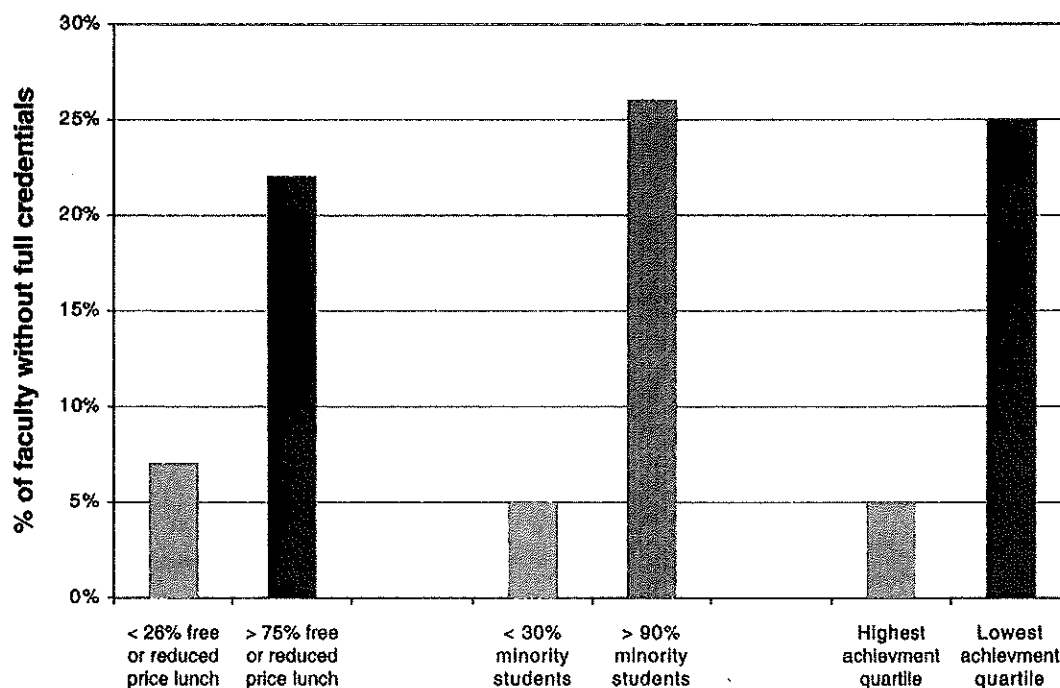


FIGURE 4. *Distribution of unqualified teachers in California, 2001. From data presented in Shields et al. (2001, pp. 24–26). Copyright 2001 by Center for the Future of Teaching and Learning. Reprinted with permission.*

increase while resources were declining. In 1990, for example, the Los Angeles City School District was sued by students in predominantly minority schools because their schools not only were overcrowded and less well funded than other schools but also were disproportionately staffed by inexperienced and unprepared teachers hired on emergency credentials. Unequal assignment of teachers creates ongoing differentials in access to high-quality instruction as well as to curriculum offerings requiring specialized expertise (Rodriguez et al. v. Los Angeles Unified School District, 1992).

The disparities in access to well-qualified teachers are large and growing worse. In 2001, for example, students in California's most segregated minority schools were more than 5 times as likely to have uncertified teachers as those in predominantly White schools. In the 20% of schools serving almost exclusively students of color, more than 20% of teachers were uncertified (Shields et al., 2001; see Figure 4). Similar inequalities have been documented in lawsuits challenging school funding in Massachusetts, South Carolina, New York, and Texas, among other states. By every measure of qualifications—certification, subject matter background, pedagogical training, selectivity of college attended, test scores, or experience—less-qualified teachers are found in schools serving greater numbers of low-income and minority students (Lankford, Loeb, & Wyckoff, 2002; NCES, 1997). In Jeannie Oakes's (1990) nationwide study of the distribution of mathematics and science opportunities, students in high-minority schools had less than a 50% chance of being taught by math or science teachers who held a degree and a license in the fields they taught.

These disparities are most troubling given recent evidence about the influence of teacher quality on student achievement. In an analysis of 900 Texas school districts, Ronald Ferguson (1991) found that the single most important measurable predictor of student achievement gains was teacher expertise, measured by

teacher performance on a state certification exam, along with teacher experience and master's degrees. Together these variables accounted for about 40% of the measured variance in student test scores. Holding socioeconomic status constant, the wide variation in teachers' qualifications in Texas accounted for almost all of the variation in Black and White students' test scores. That is, after controlling for socioeconomic status, Black students' achievement would have been closely comparable to that of Whites if they had been assigned equally qualified teachers.

Ferguson (1991) also found that class size, at the critical point of an 18-to-1 student-teacher ratio, was a statistically significant determinant of student outcomes, as was small school size. Other data also indicate that Black students are likely to attend larger schools than White students (Paterson Institute, 1996) with much-larger-than-average class sizes (NCES, 1997, p. A-119).

A number of other studies have found that teacher quality affects student achievement. Those who lack preparation in either subject matter or teaching methods are significantly less effective in producing student learning gains than those who are fully prepared and certified (see, e.g., Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2006; Darling-Hammond, 2000; Darling-Hammond, Holtzman, Gatin, & Heilig, 2005; Hawk, Coble, & Swanson, 1985; Goldhaber & Brewer, 2000; Monk, 1994). Students' access to well-qualified teachers can be a critical determinant of whether they succeed on the state tests often required for promotion from grade to grade, for placement into more academically challenging classes, and for graduation from high school. Researchers have found that the proportion of teachers in a school who are fully certified influences the likelihood that students will do well on required state tests, after controlling for student characteristics such as poverty (Betts, Rueben, & Danenberg, 2000; Fetler, 1999; Fuller, 1998, 2000; Goe, 2002; Strauss & Sawyer, 1986).

Furthermore, recruits who are not prepared for teaching are much more likely to leave teaching quickly (Henke, Chen, Geis, & Knepper, 2000; National Commission on Teaching and America's Future [NCTAF], 2003), many staying only a year or two. This adds additional problems of staff instability to the already difficult circumstances in which urban students attend school. Where these hiring practices dominate, many children are taught by a parade of short-term substitute teachers, inexperienced teachers without support, and underqualified teachers who do not know their subject matter or effective teaching methods well. When large numbers of teachers in a school are inexperienced and underprepared, instructional capacity is further undermined by the fact that there are not enough knowledgeable senior teachers to mentor others, guide curriculum decisions, and keep the instructional program afloat. Professional development funds are wasted on a revolving door of newcomers, while the benefits of these investments do not accrue within the school to produce a stronger schoolwide knowledge base.

In addition, when faced with shortages, districts often assign teachers outside their fields of qualification, expand class sizes, or cancel course offerings. These strategies are used most frequently in schools serving large numbers of minority students (NCES, 1997; NCTAF, 1997). No matter what strategies are adopted, the quality of instruction suffers. This sets up the school failure that society predicts for low-income and minority children—a failure that it helps to create for them by its failure to deal effectively with the issues of teacher supply and quality.

Unequal Access to High-Quality Curriculum

In addition to being taught by less qualified teachers than their White counterparts, students of color face stark differences in courses, curriculum materials, and equipment. Unequal access to high-level courses and a challenging curriculum explains another substantial component of the difference in achievement between minority students and White students. While course taking is strongly related to achievement, there are large differences among students of various racial and ethnic groups in course taking in areas such as mathematics, science, and foreign language (Pelavin & Kane, 1990). For students with similar course-taking records, achievement test score differences by race/ethnicity narrow substantially (Jones, 1984; Jones, Burton, & Davenport, 1984; Moore & Smith, 1985). When students of similar backgrounds and initial achievement levels are exposed to more and less challenging curriculum material, those given the richer curriculum opportunities outperform those placed in less challenging classes (Gamoran & Berends, 1987; Gamoran & Hannigan, 2000; Peterson, 1989; Oakes, 1985).

One source of inequality is the fact that high-minority schools are much less likely to offer advanced and college preparatory courses than are schools that serve affluent and largely White populations of students, offering more remedial courses, smaller academic tracks, and larger vocational programs (Oakes, 1990, 2004). Thus African Americans, Hispanics, and American Indians traditionally have been underrepresented in academic courses, "gifted-and-talented" programs, and honors and Advanced Placement programs and overrepresented in special education courses, where the curriculum is the most watered down and, in many states, teachers are least well qualified. For example, the enrollment rates of African American and Latino high school students in college

preparatory courses such as biology and calculus are less than half their share of the school population.

These inequalities in access to a high-quality curriculum are reinforced by the lack of teachers who can successfully teach heterogeneous groups of students or who can teach the upper-level courses. Tracking persists in the face of growing evidence that it does not substantially benefit high achievers and tends to put low achievers at a serious disadvantage (Hoffer, 1992; Kulik & Kulik, 1982; Oakes, 1985; Slavin, 1990), in part because good teaching is a scarce resource and thus must be allocated. Scarce resources tend to get allocated to the students whose parents, advocates, or representatives have the most political clout. This typically results in the most highly qualified teachers offering the most enriched curricula to the most advantaged students. Evidence suggests that teachers themselves are tracked, with those judged to be the most competent, experienced, or high status assigned to the top tracks and those with the least experience and training assigned to the lower tracks (Finley, 1984; NCTAF, 1996; Oakes, 1986; Talbert, 1990).

Tracking exacerbates differential access to knowledge. Although test scores and prior educational opportunities may provide one reason for differential placements, race and socioeconomic status play a distinct role. Even after test scores are controlled, race and socioeconomic status determine assignments to high school honors courses (Gamoran, 1992) as well as to vocational and academic programs and more or less challenging courses within them (Oakes, 1992; Useem, 1990). Oakes's (1993) research in San Jose, California, demonstrates vividly how students with the same standardized test scores are tracked "up" and "down" at dramatically different rates by race. Latino students, for example, who score near the 60th percentile on standardized tests are less than half as likely as White and Asian students to be placed in college preparatory classes. Even those Latino students who score above the 90th percentile on such tests have only about a 50% chance of being placed in a college preparatory class, while White and Asian students with similar scores have more than a 90% chance of such placements. (See Figure 5.)

These patterns are in part a function of prior placements of students in tracked courses in earlier grades, in part due to counselors' views that they should advise students in ways that are "realistic" about their futures, and in part due to the greater effectiveness of parent interventions in tracking decisions for higher socioeconomic status students.

Tracking in U.S. schools starts much earlier and is much more extensive than in most other countries, where sorting does not occur until high school. In U.S. schools, starting in elementary schools with the designation of instructional groups and programs based on test scores and recommendations, tracking becomes highly formalized by junior high school. From gifted-and-talented programs at the elementary level through advanced courses in secondary schools, the most experienced teachers offer rich, challenging curricula to select groups of students, on the theory that only a few students can benefit from such curricula. Yet the distinguishing feature of such programs, particularly at the elementary level, is not their difficulty but their quality. Students in these programs are given opportunities to integrate ideas across fields of study. They have opportunities to think, write, create, and develop projects. They are challenged to explore. Though virtually all students

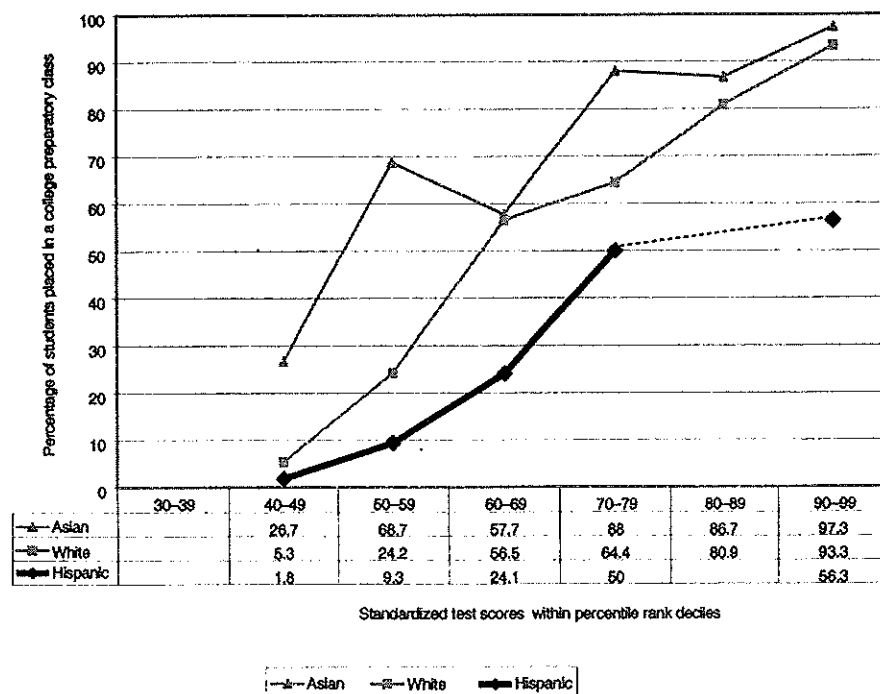


FIGURE 5. *Likelihood of placement in a college preparatory course, ninth grade (1985–1992), controlling for standardized test scores. Dotted line indicates that there were no data points in the 80–89 band for Hispanic students. Data are from an unpublished report by Jeannie Oakes (1993). Reproduced with permission.*

would benefit from being taught in this way, their opportunities remain acutely restricted. The result of this practice is that challenging curricula are rationed to a very small proportion of students, and far fewer U.S. students ever encounter the kinds of curriculum that students in other countries typically experience (McKnight et al., 1987; Useem, 1990; Wheelock, 1992).

Many studies have found that students placed in the lowest tracks or in remedial programs are most apt to experience instruction geared only to rote skills, working at a low cognitive level on test-oriented tasks that are profoundly disconnected from the skills they need to learn. Rarely are they given the opportunity to talk about what they know, to read real books, to research and write, and to construct and solve problems in mathematics, science, or other subjects (Cooper & Sherk, 1989; Oakes, 1985). Yet these are the practices essential to the development of higher order thinking skills and sustained academic achievement. The most effective teachers provide active learning opportunities involving student collaboration and many uses of oral and written language, help students access prior knowledge that will frame for them the material to be learned, structure learning tasks so that students have a basis for interpreting the new experiences they encounter, provide hands-on learning opportunities, and engage students' higher order thought processes, including their capacities to hypothesize, predict, evaluate, integrate, and synthesize ideas (Braddock & McPartland, 1993; Garcia, 1993; Resnick, 1987; Wenglinsky, 2002).

New Standards and Old Inequalities

While these inequalities in educational opportunity continue—and actually have grown worse in many states over the past two

decades—the increasing importance of education to individual and societal well-being has spawned an education reform movement in the United States focused on the development of new standards for students. Virtually all states have created new standards for graduation, new curriculum frameworks to guide instruction, and new assessments to test students' knowledge. Many have put in place high-stakes testing systems that attach rewards and sanctions to students' scores on standardized tests. These include grade retention or promotion as well as graduation for students, merit pay awards or threats of dismissal for teachers and administrators, and extra funds or loss of registration, reconstitution, or loss of funds for schools. The recently enacted NCLB reinforces these systems, requiring all schools receiving funding to test students annually and enforcing penalties for those that do not meet specific test score targets both for students as a whole and for subgroups defined by race/ethnicity, language, socioeconomic status, and disability.

The rhetoric of “standards-based” reforms is appealing. Students cannot succeed in meeting the demands of the new economy if they do not encounter much more challenging work in school, many argue, and schools cannot be stimulated to improve unless the real accomplishments—or deficits—of their students are raised to public attention. There is certainly some merit to these arguments. But standards and tests alone will not improve schools or create educational opportunities where they do not now exist.

The implications of standards-based reform for students who have not received an adequate education are suggested by recent data from Massachusetts, which began to implement high-stakes testing in the late 1990s. As the state's accountability system was

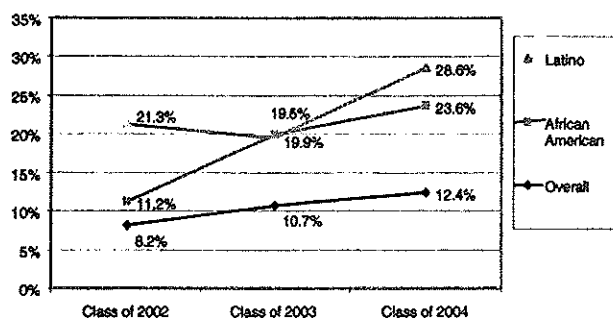


FIGURE 6. *Percentage of 9th-grade Massachusetts students who dropped out or disappeared between 9th and 10th grades. Data are from Massachusetts Department of Education, Dropout Rates in MA Public Schools (1999, 2000, 2001) and Enrollment Data by Grade, from <http://www.doe.mass.edu/info/services/reports/enroll/>.*

phased in, there was a 300% increase in middle school dropouts between the 1997–1998 and 1999–2000 school years. When the exit exam took effect in 2003, and school ratings were tied to student pass rates in the 10th grade, greater proportions of students began disappearing from schools between 9th and 10th grades, most of them African American and Latino. (See Figure 6.)

In 2003, graduation rates for the group of 9th graders who had entered high school 4 years earlier decreased for all students but most sharply for students of color. Whereas 71% of African American students graduated in the class of 2002, only 59.5% graduated among those who began 9th grade with the class of 2003, a proportion that dropped further in the following year (Bernstein, 2004). Graduation rates for Latino students went from 54% in the class of 2002 to 45% in the class of 2003. Meanwhile many of the steepest increases in test scores occurred in schools with the highest retention and dropout rates. For example, Wheelock (2003) found that, in addition to increasing dropout rates, high schools receiving state awards for gains in 10th-grade pass rates on the Massachusetts Comprehensive Assessment System (MCAS) test showed substantial increases in prior-year 9th-grade retention rates and in the percentage of “missing” 10th graders. Thus many schools improved their test scores by keeping low-achieving students out of the testing pool or out of school entirely.

Studies have linked dropout rates in other states to the effects of grade retention, student discouragement, and school exclusion policies stimulated by high-stakes testing (Haney, 2000; Heilig, 2006; Jacob, 2002; Orfield & Ashkinaze, 1991). Researchers have found that systems that reward or sanction schools on the basis of average student scores create incentives for pushing low scorers into special education (Allington & McGill-Franzen, 1992; Figlio & Getzler, 2002), retaining students in a grade so that their grade-level scores will look better (Haney, 2000; Heilig, 2006; Jacob, 2002)—a practice that increases later dropout rates by excluding low-scoring students from admissions (Darling-Hammond, 1991; Smith, 1986) and encouraging such students to transfer or drop out (Haney, 2000; Heilig, 2006; Orfield & Ashkinaze, 1991; Smith, 1986).

Furthermore, teachers increasingly report that the curriculum is distorted by tests and that they feel pressured to “teach to the test” in ways that contradict their ideas of sound instructional practice, especially where students are generally lower performing and hence

in danger of not passing the tests (Herman & Golan, 1993). An *Education Week* (2001) survey of more than 1,000 public school teachers reported that 85% said that their schools gave less attention to subjects that were not on the state tests. Teachers in high-stakes testing states also more often said they could not use computers to teach writing because the state test is handwritten (Pedulla et al., 2003). One Texas teacher noted, “At our school, third- and fourth-grade teachers are told not to teach social studies and science until March” (Hoffman, Assat, & Paris, 2001). Teachers often feel that their responses to tests are not educationally appropriate. As two Florida teachers observed (Southeast Center for Teaching Quality, 2003),

Before FCAT [Florida Comprehensive Assessment Test] I was a better teacher. I was exposing my children to a wide range of science and social studies experiences. I taught using themes that really immersed the children into learning about a topic using their reading, writing, math, and technology skills. Now I’m basically afraid to NOT teach to the test. I know that the way I was teaching was building a better foundation for my kids as well as a love of learning. Now each year I can’t wait until March is over so I can spend the last two and a half months of school teaching the way I want to teach, the way I know students will be excited about. (First teacher)

I believe that the FCAT is pushing students and teachers to rush through curriculum much too quickly. Rather than focusing on getting students to understand a concept fully in math, we must rush through all the subjects so we are prepared to take the test in March. This creates a surface knowledge or many times very little knowledge in a lot of areas. I would rather spend a month on one concept and see my students studying in an in-depth manner. (Second teacher)

Interestingly, international assessments have shown that higher scoring countries in mathematics and science teach *fewer* concepts each year but teach them more deeply than tends to be true in the United States, so that students have a stronger foundation to support higher order learning in the upper grades (McKnight et al., 1987). Ironically, states that test large numbers of topics in a grade level may encourage more superficial coverage, leading to less solid learning.

Equally important is evidence that increases in test scores on rote-oriented tests do not stimulate increases on assessments that look for more analytic thinking (Amrein & Berliner, 2002; Klein, Hamilton, McCaffrey, & Stecher, 2000); and there is evidence that students are not learning in ways that will enable them to use information and apply it to real-world problems—a reminder of the PISA problem discussed earlier. As one Texas teacher noted in a survey,

I have seen more students who can pass the TAAS [Texas Assessment of Academic Skills] but cannot apply those skills to anything if it’s not in the TAAS format. I have students who can do the test but can’t look up words in a dictionary and understand the different meanings. . . . As for higher quality teaching, I’m not sure I would call it that. Because of the pressure for passing scores, more and more time is spent practicing the test and putting everything in TAAS format. (Haney, 2000, Part 6, p. 10)

Reform rhetoric notwithstanding, the key question for students, especially those of color, is whether investments in better teaching, curriculum, and schooling will follow the press for new standards, or whether standards built upon a foundation of continued inequality

Table 3
South Carolina: Relationship Between Student Achievement, Race, and District Resources
(Dependent Variable: Percentage of Students Scoring "Below Basic" on State Tests)

Variable	Model 1		Model 2		Model 3		Model 4	
	Coefficients (t value)	p	Coefficients (t value)	p	Coefficients (t value)	p	Coefficients (t value)	p
Constant	1.485 (.537)	.593	40.672 (6.007)	.000	49.960 (2.263)	.027	.354 (.021)	.983
Poverty index	.401 (5.619)	.000					.427 (5.107)	.000
% Black students	.134 (2.706)	.008					.034 (.601)	.550
% Teachers on substandard certificates			1.940 (6.270)	.000	1.714 (4.940)	.000	.713 (2.596)	.011
% Teachers with advanced degrees			-.243 (-2.086)	.040	-.220 (-1.383)	.171	-.039 (-.347)	.729
% Teachers with uncompetitive bachelor's degrees			.059 (1.149)	.254	.054 (.973)	.334	.020 (.515)	.608
% Vacancies open for more than 9 weeks			1.885 (2.988)	.004	1.903 (2.687)	.009	.497 (.974)	.333
% Out-of-state teachers			-.173 (-1.900)	.061	-.162 (-1.754)	.084	.091 (1.263)	.211
% Certified teachers with out-of-field permits			-2.417 (-5.281)	.000	-1.746 (-2.773)	.007	-.781 (-1.725)	.089
Student-teacher ratio					-.164 (-.584)	.561	.040 (.202)	.841
Average teacher salary					.000 (-.298)	.767	.000 (.037)	.971
% Portable classrooms					-.057 (-1.501)	.138	-.036 (-1.374)	.174
R ²	.79		.64		.65		.84	

in education will simply certify student failure with greater certainty and reduce access to future education and employment. A related question, a half century after *Brown v. Board of Education*, is what it will take to secure a constitutional right to equal educational opportunity for all the nation's children.

Brown II: Back to the Courts

The advent of high-stakes testing reforms requiring students to achieve specific test score targets to advance in grade or graduate from school has occurred while educational experiences for minority students continue to be substantially separate and unequal. State efforts to set standards for all students for school progression and graduation while failing to offer equal opportunities to learn have stimulated a new spate of equity litigation in nearly 20 states across the country. These lawsuits—which may be said to constitute the next generation of efforts begun by *Brown v. Board of Education*—argue that if states require all students to meet the same educational standards, they must assume a responsibility to provide resources adequate to allow students a reasonable opportunity to achieve those standards, including well-qualified teachers, a curriculum that fully reflects the standards, and the materials, texts, supplies, and equipment needed to teach the curriculum.

Testimony in lawsuits such as those in Massachusetts and South Carolina has demonstrated how sizable the effects of school resources can be. In both states, plaintiff school districts—which are more heavily minority and low-income than these states are overall—have lower levels of overall resources, lower teachers' salaries, and lower qualification levels among teachers and other educators than are found in other districts as well as lower student performance. Both states have accountability systems based on the results of high-stakes testing and sanctioning of students, teachers, and schools for low test scores, with penalties such as grade

retention, denial of diplomas, state labeling of low-performing schools, and threats of intervention or reconstitution. The question contended by defendants and plaintiffs is whether the disparities in achievement are related to students' meaningful opportunities to learn, and whether the state has an obligation to ensure that students have access to the resources that could enable them to meet the standards that the state has set for progression in school and a passport to employment and college.

For both states, I conducted analyses examining the effects of race, poverty, and school resources on the proportions of students failing the high-stakes state tests (see Tables 3–5). The findings were remarkably similar. First, as is generally the case, student poverty levels and minority status predict a large share of the variation across districts in the proportions of students not meeting minimum standards on the state tests. Second, however, these apparent effects of student characteristics are not solely a function of the knowledge and skills that students bring to school or the conditions in which they live. School resources covary significantly with pupil characteristics. When we estimate the effects on student achievement of school resources alone (without including student characteristics), these account for well over half of the explained variance in student achievement in both states. The school resources we were able to include accounted for 65% of the total variance in students scoring "below basic" on the state tests in South Carolina and from 46% to 56% of the variance in students failing the MCAS in English and mathematics in Massachusetts, noticeably more than the influence of race.

Third, as in many other studies, among school resources, measures of teacher qualifications were the strongest school predictors of student achievement. In South Carolina, measures of teacher qualifications alone accounted for 64% of the total variance in student outcomes. The strongest predictors were teacher

Table 4
Massachusetts: Relationship Between Student Achievement, Race, and School Resources
(Dependent Variable: Percentage of Students Failing Massachusetts Comprehensive
Assessment System English Language Arts Test, All Grades)

Variable	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficients (t value)	p	Coefficients (t value)	p	Coefficients (t value)	p	Coefficients (t value)	p	Coefficients (t value)	p
Constant	4.051 (13.057)	.000	2.446 (8.971)	.000	1.703 (3.103)	.002	18.732 (5.529)	.000	11.664 (4.395)	.000
% Minority	.237 (13.473)	.000	.035 (1.393)	.165					-.017 (-.572)	.568
% Low income			.271 (14.032)	.000					.290 (11.559)	.000
% First language not English			-.014 (-.558)	.577					-.022 (-.954)	.341
% Teachers unlicensed in field ^a					.929 (7.478)	.000	1.100 (8.498)	.000	.272 (2.227)	.027
% Administrators not licensed					.077 (2.534)	.012	.055 (1.867)	.063	.022 (1.023)	.308
% Paraprofessionals not highly qualified ^b					5.513 (5.791)	.000	4.016 (4.186)	.000	-.086 (-.116)	.908
Average teacher salary (in thousands of US\$)							-.320 (-4.719)	.000	-.138 (-3.657)	.008
Net school spending / foundation budget ^c							-.011 (-.763)	.446	-.020 (-1.826)	.069
Student-teacher ratio							-.025 (-.442)	.659	-.036 (-.881)	.380
R ²	.38		.64		.39		.46		.73	

^aThe combined proportions of teachers who are not licensed at all and those who are not licensed in the field they teach.

^bThe proportion of paraprofessionals who do not meet the standards of the No Child Left Behind Act for "highly qualified" paraprofessionals.

^cThe ratio of district net school spending to the state-designated foundation budget, which is the budget level the state calculates as necessary to meet the foundation level for education, given the characteristics of students in that district.

certification status—especially the proportion of teachers without any training or certification (in contrast to those with training but teaching out of field)²—and the proportion of vacancies open for more than 9 weeks, a measure of shortages usually associated with hiring substitute teachers or other less well-qualified teachers. Both of these predictors were strongly correlated with the proportion of students scoring below basic on the state tests. The proportion of out-of-state teachers and those with advanced degrees had a small positive influence on student achievement.

In Massachusetts, the certification status of both teachers and administrators, as well as a measure of the qualifications of paraprofessionals, is significantly related to the proportions of students failing the MCAS tests in both English and mathematics, accounting for 39% of the total variance in failing scores on the English tests and 50% of the variance on the math tests. In mathematics, in addition to a measure of the overall proportion of teachers teaching either without any license or without a license in their field, we also had a measure of the proportion of high school teachers teaching mathematics or computer science who were not certified in those fields, which added to the predictive power of the estimates. Given that other dimensions of staff quality are not directly measured in the Massachusetts estimates, it is not surprising that an added measure of average teacher salary—which should capture other aspects of quality—is also significant. This measure, along with a measure of overall school spending and student-teacher ratio, increases the variance explained to 46% in English and 56% in mathematics.

When we estimate district-level student performance using both student characteristics and these school resource measures, we see

that, while poverty levels of students continue to exert a strong influence on student outcomes, race and language status are no longer significant predictors of performance. School resources matter strongly. In South Carolina, the combined effects of school resource variables account for as much of the total variance explained as do measures of race and poverty, and teacher certification status continues to exert a strongly significant influence on student achievement. In Massachusetts, where we had less school resource information available to disentangle the effects of student status from those of unequally distributed school resources, school resources nonetheless continue to account for a large share (about 40%) of the total variance explained. On the English tests, the strongest predictors are average teacher salary, which captures much of the measured and unmeasured variation in teacher quality; the proportion of teachers unlicensed in the field they teach; and overall school spending. In math, the proportion of fully certified high school math teachers exerts a strong effect, along with overall school spending, average teacher salaries, and the proportion of paraprofessionals not highly qualified.

These analyses, like those of previous studies, indicate that school resources matter, that key resources covary with the characteristics of students in public schools, and that more equitable allocations of school resources could substantially reduce the failure rates of students of color and low-income students on the high-stakes measures that states have chosen to hold students and schools accountable for their performance. The issue is whether governments can be held accountable for their own performance in ensuring that all students have the conditions and resources necessary to support their right to learn.

Table 5
Massachusetts: Relationship Between Student Achievement, Race, and School Resources
(Dependent Variable: Percentage of Students Failing Massachusetts Comprehensive
Assessment System Math Test, All Grades)

Variable	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficients (t value)	p	Coefficients (t value)	p	Coefficients (t value)	p	Coefficients (t value)	p	Coefficients (t value)	p
Constant	14.680 (21.838)	.000	10.868 (19.964)	.000	6.225 (4.855)	.000	40.406 (5.247)	.000	29.127 (5.354)	.000
% Minority	.434 (11.391)	.000	-.062 (-1.245)	.214					-.050 (-.913)	.363
% Low income			.643 (16.665)	.000					.582 (12.371)	.000
% First language not English			-.005 (-.098)	.922					-.028 (-.699)	.486
% Teachers unlicensed in field ^a					1.502 (6.153)	.000	1.757 (6.895)	.000	.111 (.495)	.621
% Math and computer teachers uncertified, Grades 9 to 12					.168 (4.482)	.000	.115 (3.071)	.002	.032 (1.286)	.200
% Administrators not licensed					.125 (1.957)	.052	.100 (1.640)	.103	-.005 (-.123)	.902
% Paraprofessionals not highly qualified ^b					.146 (7.439)	.000	.117 (6.036)	.000	.033 (2.411)	.017
Average teacher salary (in thousands)							-.536 (-3.580)	.000	-.243 (-2.342)	.020
Net school spending / foundation budget ^c							-6.765 (-2.152)	.033	-6.541 (-3.116)	.002
Student-teacher ratio							.061 (.548)	.585	.047 (.649)	.517
R ²	.31		.65		.50		.56		.82	

^aThe combined proportions of teachers who are not licensed at all and those who are not licensed in the field they teach.

^bThe proportion of paraprofessionals who do not meet the standards of the No Child Left Behind Act for "highly qualified" paraprofessionals.

^cThe ratio of district net school spending to the state-designated foundation budget, which is the budget level the state calculates as necessary to meet the foundation level for education, given the characteristics of students in that district.

Policy for Equality: Toward Genuine School Reform

The common presumption that schools currently provide a level playing field paralyzes necessary efforts to invest in schools attended primarily by students of color. If academic outcomes for minority and low-income children are to change, reforms must alter the quality and quantity of learning opportunities they encounter. To improve achievement, school reforms must assure access to high-quality teaching within the context of a rich and challenging curriculum supported by personalized schools and classes. Accomplishing such a goal will require equalization of financial resources, changes in curriculum and testing policies, and improvements in the supply of highly qualified teachers to all students.

It is worth noting that most high-achieving countries not only provide high-quality universal preschool and health care for children but also fund their schools centrally and equally, with additional funds to the neediest schools. Furthermore, they support a better-prepared teaching force—funding competitive salaries and high-quality teacher education, mentoring, and ongoing professional development for all teachers, at state expense. Unfortunately, NCLB's answer to the problem of preparing teachers for the increasingly challenging job they face has been to call for alternative routes that often reduce training for the teachers of the poor, with no systemic investments in improved preparation or ongoing learning.

Finally, most high-achieving nations focus their curriculum on critical thinking and problem solving, using examinations that require students to conduct research and scientific investigations, solve complex real-world problems in mathematics, and defend their ideas orally and in writing. These assessments are not used to rank or punish schools or to deny promotion or diplomas to students. (In fact, several countries have explicit proscriptions against such practices.) They are used to evaluate the curriculum and guide investments in professional learning—in short, to help schools improve. Finally, by asking students to show what they know through real-world applications of knowledge, these other nations' assessment systems encourage serious intellectual activities that are being driven out of U.S. schools by the tests promoted by NCLB.

To substantially improve both educational quality and equality in the United States, a comprehensive approach is needed. We cannot remain a first-class power in the new world that is emerging around us simply by calling for higher achievement and establishing more tests. We need to ensure that resources for education are adequate in every community, that curriculum and assessment support the kind of transferable learning that matters in the 21st century, and that investments in teaching produce highly skillful teachers for all students. This policy agenda must be approached systemically at the federal, state, and local levels if it is to succeed.

Resource Equalization and Adequacy

Progress in equalizing resources to students will require attention to inequalities at all levels—between states, among districts, among schools within districts, and among students differentially placed in classrooms, courses, and tracks that offer substantially disparate opportunities to learn. State funding should be allocated to students based on equal dollars per student, adjusted (or weighted) for specific student needs, such as poverty, limited English proficiency, or special education status. Developing such an equitable, reliable base of funding is critically important so that districts can afford to hire competent teachers and provide reasonable class sizes and pupil loads, which are the foundational components of quality education.

Ferguson's (1991) findings about the importance of teacher expertise for student achievement led him to recommend that investments focus on districts' capacity to hire high-quality teachers. Several studies have documented how Connecticut eliminated teacher shortages, improved teacher quality, and raised student achievement by doing just that. When the state raised and equalized teacher salaries under its 1986 Education Enhancement Act, shortages of teachers evaporated, and within 3 years, most teaching fields showed surpluses, even in the urban areas. The state raised standards for teacher education and licensing, initiated scholarships and forgivable loans to recruit high-need teachers into the profession (including teachers in shortage fields, those who would teach in high-need locations, and minority teachers), created a mentoring and assessment program for all beginning teachers, and invested money in high-quality professional development, with special aid to low-achieving districts. By 1998, Connecticut had surpassed all other states in fourth-grade reading and mathematics achievement on the NAEP and scored at or near the top of the rankings in eighth-grade mathematics, science, and writing (Baron, 1999; Wilson, Darling-Hammond, & Berry, 2001).

A systemic strategy such as this one is essential if equity and quality are to go hand in hand. Such a strategy should incorporate, along with standards for student learning, standards for educational opportunity that create two-way accountability between the government and the schools. Such standards would ensure access to the resources needed for students to achieve the learning standards, including appropriate instructional materials and well-prepared teachers. Thus, for example, if a state's curriculum frameworks and assessments outlined standards for science learning that required laboratory work and computers, certain kinds of coursework, and particular knowledge for teaching, states and districts would be responsible for allocating resources and designing policies to provide for these entitlements. Such a strategy would leverage both school improvement and school equity reform, providing a basis for state legislation or litigation where opportunities to learn were not adequately funded (Darling-Hammond, 1992–1993).

Curriculum and Assessment Reform

The curriculum offered to most African American and other students of color in U.S. schools is geared primarily toward lower order "rote" skills—memorizing pieces of information and conducting simple operations based on formulas or rules—that are not sufficient for the demands of modern life or for the new standards being proposed nationally and internationally. These new standards will require students to be able to engage in independent

analysis and problem solving, extensive research and writing, use of new technologies, and various strategies for accessing and using resources in new situations. Major changes in the curriculum, resources, and assessments will be needed to ensure that these kinds of activities are commonplace in the classrooms of all students.

Students in schools that organize most of their efforts around the kinds of low-level learning represented by most widely used multiple-choice tests are profoundly disadvantaged when they need to engage in the extensive writing, critical thinking, and problem solving required in college and the workplace. Evidence suggests that such test-like teaching is most pronounced in urban schools serving predominantly low-income students, especially in states emphasizing high-stakes tests (Darling-Hammond & Rustique-Forrester, 2005). Initiatives to develop a richer curriculum and more performance-oriented assessments that develop higher order skills have sought to address this problem in Connecticut, Kentucky, Maine, Nebraska, Oregon, and Vermont, among other states. Their assessments, which use essays and oral exhibitions as well as samples of student work such as research papers and science projects, resemble those used in most countries around the world, including the highest scoring nations that outrank the United States. Unfortunately, the administration of NCLB has tended to discourage the use of performance assessments and has reinforced the reliance on multiple-choice tests as well as their use for many purposes such as grade retention and tracking, for which they are not valid.

Efforts to create a "thinking curriculum" for all students are important to individual futures and our national welfare. They are unlikely to pay off, however, unless other critical changes are made in the curriculum, in the ways tests are used and students are tracked for instruction, and the ways teachers are prepared and supported, so that new standards and tests are used to inform more skillful and adaptive teaching that enables more successful learning for all students.

Investments in Quality Teaching

A key corollary of this analysis is that improved educational outcomes will rest substantially on policies that boost the attractions of teaching as a career, especially in high-need areas, while increasing teachers' knowledge and skills as other high-achieving nations have done. This means providing *all* teachers with a stronger understanding of how children learn and develop, how a variety of curricular and instructional strategies can address their needs, and how changes in school and classroom practices can support their growth and achievement. Providing equity in the distribution of teacher quality requires changing policies and long-standing incentive structures in education, so that shortages of trained teachers are overcome and schools serving low-income and minority students are not disadvantaged by lower salaries and poorer working conditions in the bidding war for good teachers.

If we are serious about leaving no child behind, we need to go beyond mandates to ensure that *all* students have well-qualified teachers. Effective action can be modeled after federal investments in medicine. Since 1944, the federal government has subsidized medical training to fill shortages and build teaching hospitals and training programs in high-need areas—a commitment that has contributed significantly to America's world-renowned system of medical training and care. Intelligent, targeted incentives can ensure that all students have access to teachers who are indeed highly

qualified. An aggressive national policy for teacher quality and supply, on the order of the post–World War II Marshall Plan, could be accomplished for less than 1% of the more than \$300 billion spent thus far in Iraq and, in a matter of only a few years, would establish a world-class teaching force in all communities. (For a more in-depth treatment, see Darling-Hammond & Sykes, 2003.) Such a plan would incorporate the following elements:

1. *Recruit high-need teachers* through service scholarships and forgivable loans for those who agree to train in shortage fields and practice in high-need locations. As in North Carolina's successful model (Berry, 1995), scholarships for high-quality teacher education can be linked to minimum service requirements of 4 years or more—the point at which most teachers who have remained in the classroom have committed to remaining in the profession. Because fully prepared novices are twice as likely to stay in teaching as those who lack training, shortages could be reduced rapidly if districts could hire better prepared teachers. Virtually all of the vacancies currently filled with emergency teachers could be filled with well-prepared teachers if 40,000 service scholarships of up to \$25,000 each were offered annually.

Recruitment incentives could also be used to attract and retain expert, experienced teachers in high-need schools. Federal matching grants could leverage additional compensation for teachers with demonstrated expertise who serve as mentors, master teachers, and coaches in such schools. For \$500 million annually, stipends of \$10,000 could be provided to 50,000 accomplished teachers who help improve practice in high-poverty schools. An additional \$300 million in matching grants could be used to improve teaching conditions in these schools, providing for smaller pupil loads per teacher, adequate materials, and time for teacher planning and professional development—all of which keep teachers in schools.

2. *Improve teachers' preparation* through incentive grants to schools of education focused on strengthening teachers' abilities to teach a wide range of diverse learners successfully (\$300 million). An additional \$200 million should expand state-of-the-art teacher education programs in high-need communities that create "teaching schools" partnered with universities. As in teaching hospitals, candidates study teaching and learning while gaining hands-on experience in state-of-the-art classrooms. Effective models have already been created by universities sponsoring professional development schools and by school districts offering urban teacher residencies. These residencies place candidates as apprentices in the classrooms of expert urban teachers while they earn a stipend and complete their coursework, repaying the investment with at least 4 years of service. Such programs can create a pipeline of teachers prepared to engage in best practice in the schools where they are most needed, while establishing demonstration sites for urban teaching. Funding for 200 programs serving an average of 150 candidates each at \$1,000,000 per program per year would supply 30,000 exceptionally well-prepared recruits to high-need communities each year.

3. *Support mentoring for all beginning teachers* to stem attrition and increase competence. With one third of new teachers leaving within 5 years and with higher rates for those who are underprepared, recruitment efforts are like pouring water into a leaky

bucket. By investing in state and district induction programs, we could ensure mentoring support for every new teacher in the nation. Based on the funding model used in California's successful Beginning Teacher Support and Assessment Program, a federal allocation of \$4,000 for each of 125,000 beginning teachers, matched by states or local districts, could ensure that each novice is coached by a well-trained mentor.

In the long run, these proposals would save far more than they would cost. The savings would include the more than \$2 billion dollars now wasted annually because of high teacher turnover, plus the even higher costs of grade retention, summer school, remedial programs, lost wages, and prison sentences for dropouts (another \$50 billion, increasingly tied to illiteracy and school failure). As we move into the 21st century, reducing inequality is essential to our nation's future. If "no child left behind" is to be anything more than empty rhetoric, we will need a policy strategy that equalizes access to school resources, creates a 21st-century curriculum for all students, and supports it with thoughtful assessments and access to knowledgeable, well-supported teachers.

A democracy that will survive and thrive in a world that demands a well-educated citizenry must build a system that can ensure all students the right to learn.

NOTES

¹Graduation rates are calculated as the number of students in a graduating class divided by the number of students in ninth grade 3.5 years earlier.

²Teachers on substandard certificates include all of those in a variety of certification categories who lack a full standard certificate noting that they have the requisite subject matter background and teacher training. This variable has a strong positive correlation with students scoring below basic on the state tests. Teachers who are certified but teaching at least part of the time on an "out-of-field" permit are a subset of those on substandard certificates. These are the more qualified individuals in the substandard credential pool, as they have met teacher preparation requirements in one field, though not in every field that they teach. The negative coefficient on this variable means that fewer students score poorly in districts where a greater share of the substandard credentials were granted to already certified teachers.

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