

## Third Annual Brown Lecture in Education Research

### 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 workforce 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

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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’s 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’s 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. Although 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

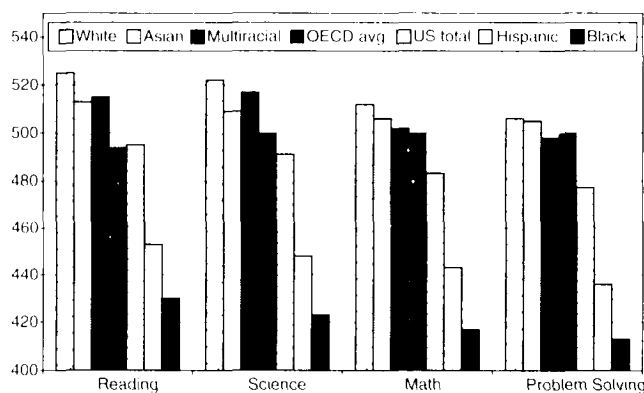


FIGURE 1. U.S. Program in International Student Assessment (PISA) results, by subgroup, compared with Organisation for Economic Cooperation and Development (OECD) average. Data are from OECD PISA 2003, as compiled in Stage (2005). Copyright 2005 by Elizabeth Stage. Reprinted with permission.

K–12 and higher education have steeply raised rates of high school graduation.

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 (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 workers, 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 would 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 in school revenues coupled with growing inequality in school spending (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 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

**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.

[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 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

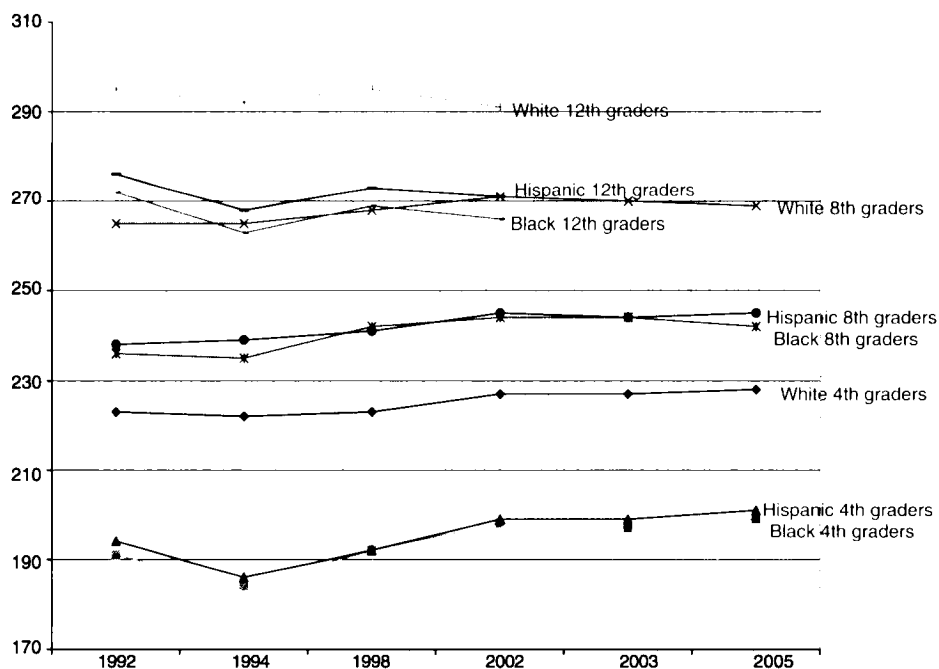


FIGURE 2. Achievement trends in reading. From National Center for Education Statistics, *National Assessment of Educational Progress Trends (2005)*.

most likely to encounter a wide array of educational resources at 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

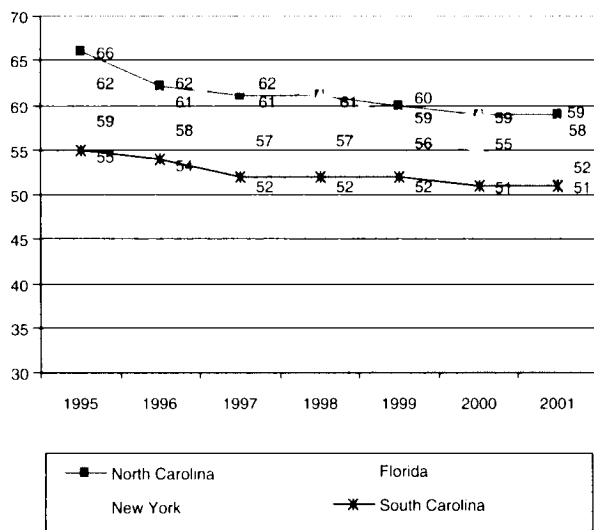


FIGURE 3. State graduation rates, 1995–2001. Data are from National Center for Education Statistics, *Common Core of Data* (2003).

students. Data from the NCES indicate that 4-year graduation rates<sup>1</sup> 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

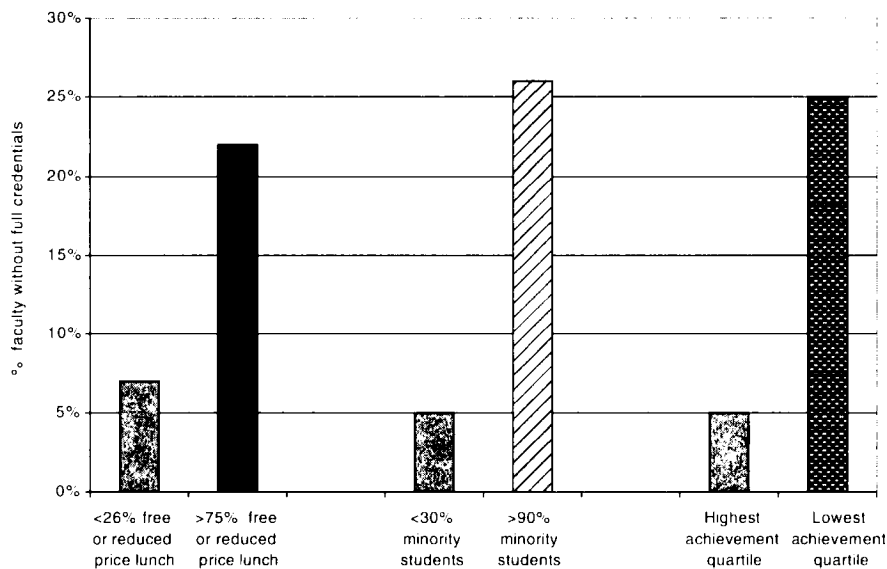


FIGURE 4. *Distribution of unqualified teachers in California, 2001. From data presented in Shields et al. (2001, pp. 24–26). Copyright 2001 by Center for the Future of Teaching and Learning. Reprinted with permission.*

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 20% of schools serving primarily 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, Gatlin, & 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; Oakes, 1985; Peterson, 1989).

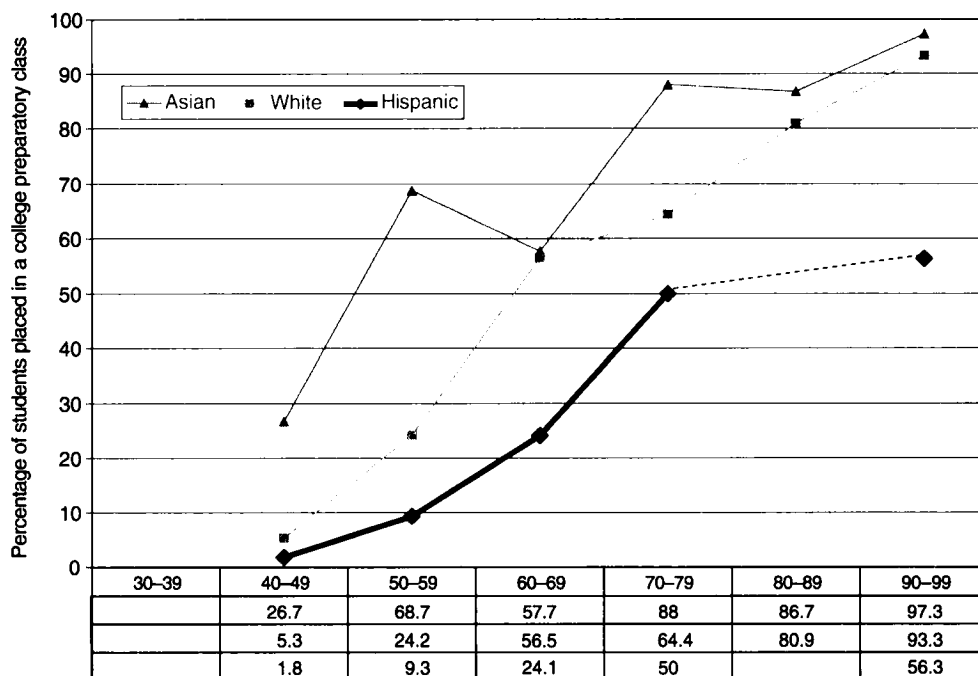
One source of inequality is the fact that high-minority schools are much less likely to offer advanced and college preparatory courses than are schools that serve affluent and largely White populations of students, offering more remedial courses, smaller academic tracks, and larger vocational programs (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 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



Standardized test scores within percentile rank deciles

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.

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 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.)



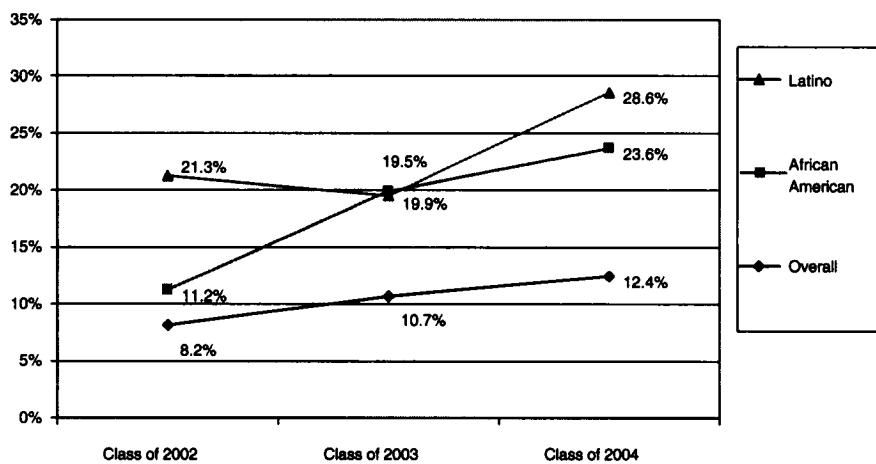


FIGURE 6. Percentage of 9th-grade Massachusetts students who dropped out or disappeared between 9th and 10th grades. Data are from Massachusetts Department of Education, *Dropout Rates in MA Public Schools (1999, 2000, 2001) and Enrollment Data by Grade*, from <http://www.doe.mass.edu/infoservices/reports/enroll/>.

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 NOT to 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

**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 <sup>2</sup>	.79		.64		.65		.84	

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 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

**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 <sup>a</sup>					.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 <sup>b</sup>					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 <sup>c</sup>							-.011 (-.763)	.446	-.020 (-1.826)	.069
Student-teacher ratio							-.025 (-.442)	.659	-.036 (-.881)	.380
R <sup>2</sup>	.38		.64		.39		.46		.73	

<sup>a</sup>The combined proportions of teachers who are not licensed at all and those who are not licensed in the field they teach.

<sup>b</sup>The proportion of paraprofessionals who do not meet the standards of the No Child Left Behind Act for "highly qualified" paraprofessionals.

<sup>c</sup>The 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.

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 certification status—especially the proportion of teachers without any training or certification (in contrast to those with training but teaching out of field)<sup>2</sup>—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

**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 <sup>a</sup>					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 <sup>b</sup>					.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 <sup>c</sup>							-6.765 (-2.152)	.033	-6.541 (-3.116)	.002
Student-teacher ratio							.061 (.548)	.585	.047 (.649)	.517
R <sup>2</sup>	.31		.65		.50		.56		.82	

<sup>a</sup>The combined proportions of teachers who are not licensed at all and those who are not licensed in the field they teach.

<sup>b</sup>The proportion of paraprofessionals who do not meet the standards of the No Child Left Behind Act for "highly qualified" paraprofessionals.

<sup>c</sup>The 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.

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.

### 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 course work, 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 Teaching Fellows 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 course work, 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

<sup>1</sup> Graduation 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.

<sup>2</sup> Teachers 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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