

EDUCATION AND THE NATION'S FUTURE

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The quality of schools in the United States has received constant federal attention since the 1957 launch of Sputnik, America's first major intellectual scare. Pronouncements, commissions, and legislation have all followed at fairly regular intervals since then, and scarcely anyone argues that we are in a good place with education. Yet evidence of improvement is hard to find. In simplest terms, the future of the United States is closely related to the education of its population, and the nation requires strong leadership to move it to a better position.

This essay reviews the current state of American education and discusses why it is important. The main focus is K-12 education, where the largest concerns rest; but there is attention given to specifics elsewhere. It then considers alternative policy approaches and the role of the federal government.

WHERE THE UNITED STATES STANDS

Historically, the United States outpaced the rest of the world in terms of human capital. The United States introduced universal secondary schooling before other developed countries. But today the United States has below-average secondary school completion rates among OECD (Organisation for Economic Co-operation and Development) countries.

More importantly, achievement of US students lags behind students in a large number of countries. There have been over a dozen internationally comparable tests of student knowledge in mathematics and science, and each points to large differences between the skills of our students and those of many other countries' students. As figure 1 shows, according to the most recent PISA tests of 15-year-olds, we are competing with Latvia, Hungary, and Portugal—and just slightly ahead of Spain and Italy. (PISA is the Programme for International Student Assessment, a set of tests administered every three years across approximately seventy countries.) These are not the countries to which we want to be compared.

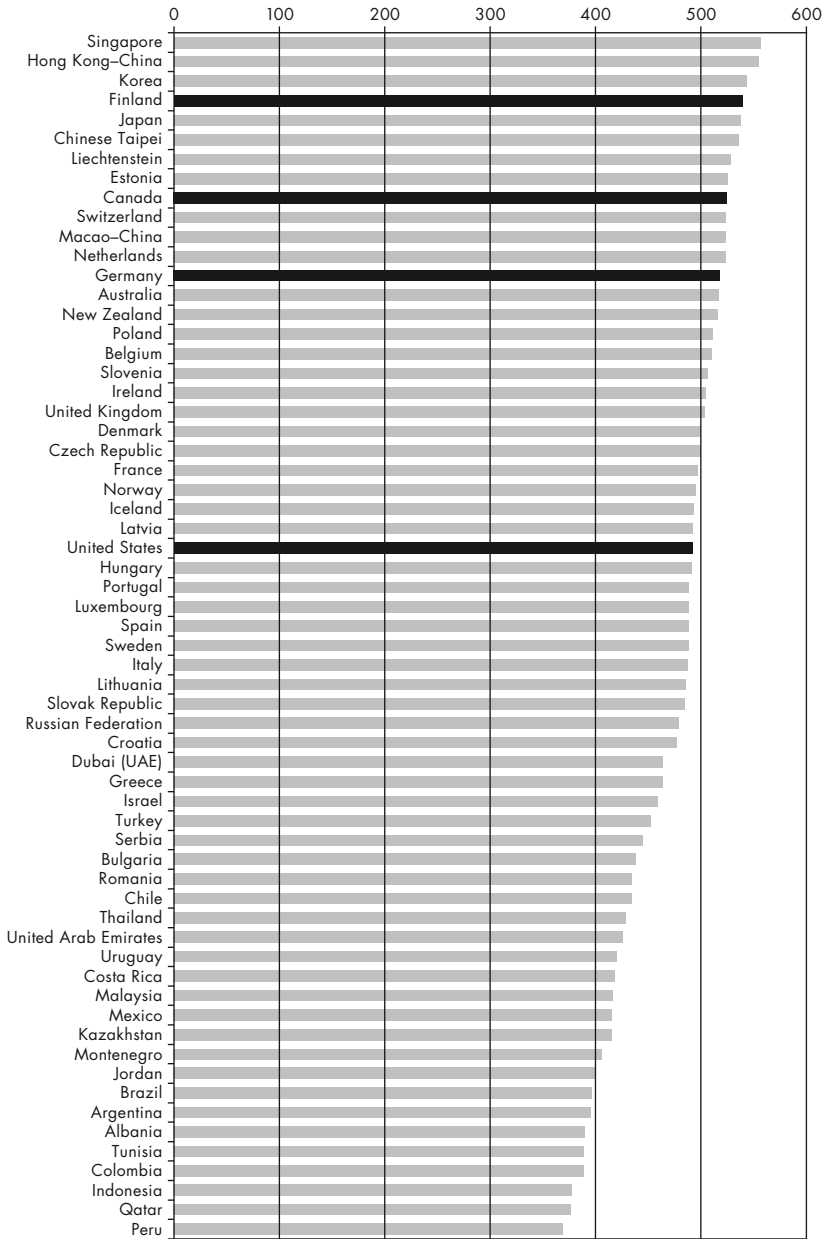
Canada, however, does much better than the United States. Canada is culturally and economically comparable to the United States, so it is worth noting that its students do significantly better than ours. The figure also highlights performance in Germany and Finland, countries that provide other possible benchmarks for US performance and to which we refer when considering the economic implications of school improvement.

WHY IT IS IMPORTANT

Differences in performance on these tests are reliable indicators of skills that are important economically. In today's knowledge-based economy, skills drive future productivity gains and economic growth. And it is growth that determines the economic well-being of the country.

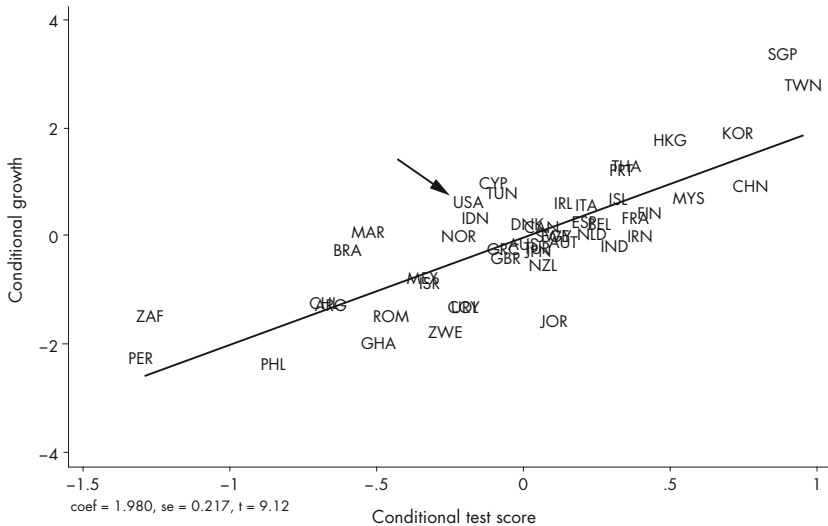
The importance of cognitive skills can be seen in figure 2, which plots average annual growth rates in real per capita GDP over the period 1960–2000 for fifty countries (all that have data on economic growth and test scores). This figure provides “conditional” growth and test scores because underlying it is a statistical analysis that also accounts for differences in income in 1960, since it is easier to grow fast if all you have to do is copy what other countries are doing.¹

Figure 1. **International Mathematics and Science Performance**



SOURCE Author's calculations from OECD (2010, 2013).

Figure 2. **Economic Growth and Achievement in Mathematics and Science, 1960–2000**



NOTE This added variable plot is derived from a regression of average annual growth in GDP per capita on test scores, GDP per capita in 1960, and average years of school attained in 1960; see Hanushek and Woessmann (2015), Table 3.1.

SOURCE Hanushek and Woessmann (2015).

As can be seen, a large portion of the variations in growth rates can be explained by the test score performance across nations. The statistical analysis behind this graph also supports a causal interpretation of this relationship. In other words, if a nation finds a way to improve the skills of its youth measured by these tests, it can reasonably expect its long-run growth rate to improve.

The United States falls in the middle of the distribution. Moreover, because of historic advantages—having good economic institutions that support growth, historically strong investments in human capital, the best colleges and universities, and a supply of strong immigrants—the US performance was better than expected (i.e., it is above the line).

These differences in growth portrayed in the figure are very

important. We can use the historic impact of skills on growth to project the economic implications of improving our schools. It turns out that this is a very steep line and improvements in skills (as measured by these international tests) would have a dramatic impact on the future of the United States. Moving from the current US position to the top of the test score distribution would, by the historical relationship, raise growth by 2 percentage points. US per capita GDP growth has been less than 2 percent lately, so this would more than double our growth rate.

Moving to the top of world achievement rankings is clearly very difficult, but more realistic improvements yield enormous gains. Table 1 provides estimates of the economic value of improving achievement by varying amounts. The achievement targets are those of Germany, Canada, and Finland, and the table shows projections of the economic gains that could be expected from having US students reach these levels over a twenty-year period. The economic gains simply assume that the historical growth relationship depicted in figure 2 holds into the future and that the quality of the labor force progressively improves as new, better-educated workers replace retiring ones. The impacts on growth are projected over an eighty-year period (the life expectancy of somebody born today). The economic gains are the difference in GDP expected with no improvement in schools versus the improvement to Germany, Canada, or Finland, and all future values are discounted so that we can calculate the present value of these gains. (The present value is simply how much future gains in income are worth today, and this allows the overall gains for future periods to be directly compared to values of GDP today.)

From table 1, bringing our schools up to the level of Germany over a two-decade period would yield a present value of \$43.8 trillion, an enormous value compared to our current GDP of about \$17 trillion. The present value is 2.58 times current GDP, or an increase in the level of GDP by more than 6 percent of what is expected with no change in schools.² This average increase in

Table 1. **Economic Value of Alternative Improvements in US Achievement**

	Being Germany	Being Canada	Being Finland	Achieving NCLB
Present value (trillion \$)	\$43.8	\$82.2	\$111.9	\$86.2
Present value (as a % of current GDP)	258%	482%	658%	507%
Average % increase in future GDP level	6.2%	11.4%	15.8%	12.1%

SOURCE Eric A. Hanushek, Paul E. Peterson, and Ludger Woessmann, *Endangering Prosperity: A Global View of the American School* (Washington, DC: Brookings Institution Press, 2013).

GDP more than covers all projected federal deficits, solves the Social Security and Medicare funding problems, and leaves added money for many other purposes.

The gains for reaching the schooling level of Canada or Finland go up from there. Attaining Canadian levels would lift the level of GDP by more than 11 percent. This increase is roughly equivalent to an average increase of paychecks for all workers of over 20 percent. Reaching Finnish levels is worth over \$100 trillion in present value.

The final column in table 1 considers the impact of reaching the goal of No Child Left Behind (NCLB) of having all children at proficiency levels (except this would not occur for another twenty years, instead of 2014, as envisioned in the original legislation). Reaching NCLB would, by historical patterns, raise the level of GDP by 12 percent.

What students learn in school matters far more than how long they go to school. Statistical analysis of differences in growth across countries indicates that differences in the number of years of schooling have no separate impact on economic growth once

cognitive skills, or learning, are taken into account. Early cognitive development leads people to get more schooling, and early K-12 learning strongly influences the skills they will acquire with later schooling and college. Emphasizing attainment (such as high school graduation) without considering the quality of learning does not make sense.

SOURCES OF IMPROVEMENT

Improving schools, while the professed goal of the public and of politicians since Sputnik, has proven difficult. Spending on schools has dramatically increased, showing a quadrupling in real terms since 1960. Yet the performance since 1970 of seventeen-year-olds has been constant in mathematics and reading (according to the National Assessment of Educational Progress, or NAEP).

The increases in spending have gone largely toward dramatic declines in pupil-teacher ratios (from 25.8:1 in 1960 to 15.3:1 in 2008). Real teacher salaries have also gone up, but more modestly: an 8 percent increase from 1994 to 2008. Unfortunately, research shows that these are not the things that drive improvements in student outcomes.

The most consistent factor affecting student achievement is the quality of teachers. The differences in teacher quality are startling.

A direct way of seeing the potential impact of teachers is to look at differences in the growth of student achievement across teachers. It is natural to define good teachers as those who consistently obtain high learning growth from students, while poor teachers are those who consistently produce low learning growth. A substantial number of studies of learning gains (or value-added) of teachers exist, and they indicate clearly how much difference can come to a student based on teacher assignment. In one study, teachers near the top of the quality distribution got an entire year's worth of additional learning out of their students compared to teachers near the bottom. Importantly, this analysis considered kids just from minority and poor inner-city families, indicating

that family background is not fate and that good teachers can overcome deficits that might come from poorer learning conditions in the home.

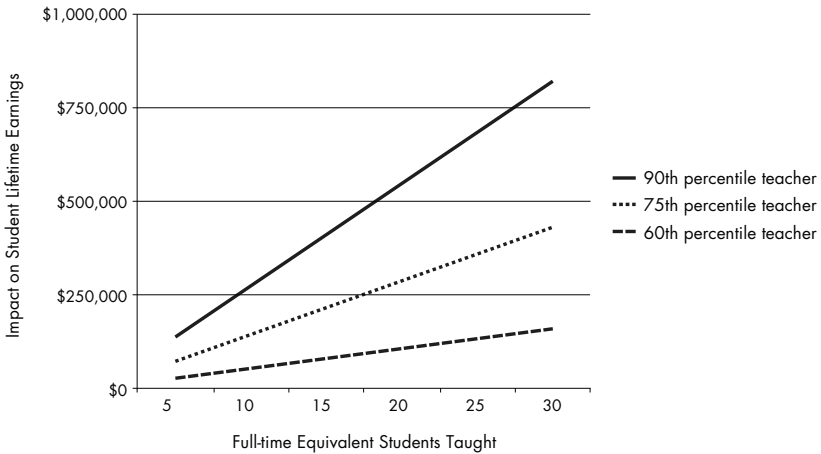
A second perspective comes from combining existing quantitative estimates of differences in teacher quality with achievement gaps by race or income. Having a good teacher as opposed to an average one for three to four years in a row would, by available estimates, close the average achievement gap by income. Closing the black-white achievement gap, which is a little larger than the average income gap, would take good teachers three and a half to five years in a row.

But, perhaps the most salient perspective for the discussion of teacher salaries is to calculate the impact of effective teachers on the future earnings of students. A teacher who raises the achievement of a student will tend, other things being equal, to raise earnings throughout that student's work life. Using 2010 earnings, for example, a teacher in the seventy-fifth percentile (when compared to the average teacher) would on average raise each student's lifetime income by somewhat more than \$14,300. With a class of twenty-five students, this teacher would add \$358,000 in future income compared to an average teacher.³

Figure 3 shows the total contribution of teachers at the sixtieth, seventy-fifth, and ninetieth percentile compared to an average teacher and how this varies with the number of students taught. Excellent teachers add over \$800,000 to the students in a class of thirty. Even a teacher just above average at the sixtieth percentile would add over \$100,000 to a class of twenty students. These are calculations for each school year. These above-average teachers add hundreds of thousands of dollars to their students' lifetime earnings.

But there is also the darker side. Below-average teachers subtract from student earnings at a similar rate. The tenth percentile teacher, compared to an average teacher, subtracts over a half-million dollars per year for each group of twenty students he teaches. For the tenth, twenty-fifth, and fortieth percentile

Figure 3. **Impact on Student Lifetime Incomes by Class Size and Teacher Effectiveness (compared to average teacher)**



SOURCE Hanushek, Eric A. 2011. “The Economic Value of Higher Teacher Quality,” *Economics of Education Review* 30, No. 3 (June): 466–479.

teacher, one simply has to put a minus sign in front of the values seen in figure 3.

Summarizing decades of research on education, we find that high-quality teachers are the most important ingredients in education. Regardless of class size, facilities, tests, standards, and curriculum, no factor makes a greater difference to education outcomes than better teachers.⁴

INSTITUTIONAL STRUCTURES AND INCENTIVES IN THE SCHOOL SYSTEM

Existing evidence suggests some clear general policies, each of which is related to incentives that ensure hiring and retaining high-quality teachers and administrators. The relevant incentives, in turn, are created by the institutions of the education system—the rules and regulations that set rewards and penalties for the people involved in the education process.

From existing research, four interrelated policies come to the

forefront. School systems must: evaluate and reward directly good teacher performance; promote more competition, so that parental demand will create strong incentives to improve individual schools; offer greater autonomy in local decision-making, so that individual schools and their leaders can take actions to promote student achievement; and set up an accountability system that demands good school performance and rewards results.

Direct rewards. Given the importance of high teacher quality, a candidate for improvement is the specific form of accountability that aims incentives directly at teachers. While convincing evidence on the effects of performance-related teacher pay is scarce, the more rigorous studies in terms of empirical identification tend to find a positive relationship between financial incentives for teachers and student outcomes.

Most existing evaluations of performance pay systems nonetheless focus on whether existing teachers change their behavior—what is referred to as the “effort” margin. There are many reasons to believe, however, that the “selection” margin—the attraction of new teachers and the retention of the more effective ones—is more important. The importance of pay for selection is difficult to analyze because it generally involves considering longer-run incentives and the evaluations must focus on moves of teachers in and out of schools. One evaluation keyed to the selection margin in schools in Washington, DC, where the pay and retention system emphasizes rewarding the best teachers while dismissing the worst, finds strong achievement results.⁵ Cross-country variation provides some indication that students perform better in countries that allow for teacher salaries to be adjusted based on performance in teaching. For example, the introduction of performance-related pay had a substantial positive impact on student achievement in England. From a comparison across countries, there is evidence that aggregate changes in salaries over time lead to higher student performance. At the school level, monetary incentives for teachers based on their students’ performance have also been

shown to improve student learning very significantly in Israel and in India.⁶

A key element of rewarding performance is having a good evaluation system that can fit into the personnel system. On this score, a majority of states have made gains, largely in terms of linking a portion of evaluations to the performance of students. These changes have occurred through the actions of state legislatures, although the courts have also been involved.⁷ An important California court case (*Vergara v. California*) ruled that a set of state tenure and dismissal laws were unconstitutional because they harmed the children who must be in classes with teachers who otherwise would have been dismissed.⁸

In sum: by far the most effective way to get good teachers is for schools to be able to fire teachers who do poorly, to make way for more promising candidates. It does no good to attract good teachers with higher salaries if there are no slots for them to work, or if they are the first to be fired under age- or tenure-based contracts. The “selection” margin is far more effective in teaching than the “effort” margin, as it is in every other business. And this margin is effectively closed in most of America’s public schools.

School accountability. It is difficult to imagine any reform programs—whether those of autonomy, choice, direct performance rewards, or others—working well without a good system of student testing, measurement, and accountability. Thus, the ideas about the various institutional structures are closely linked, since an accountability system provides for linking other incentives to student outcomes.

Many countries around the world have been moving toward increased accountability of local schools for student performance. The United Kingdom has developed an elaborate system of “league tables” designed to give parents full information about the performance of local schools. The United States had a federal law (No Child Left Behind) that all states must have an accountability system that meets certain general guidelines, although this was

replaced in 2015 by a new federal system (Every Student Succeeds Act). Under this new law, individual states have considerably increased latitude in designing their accountability system; the results of this change are currently unknown.

Evidence on the impact of accountability systems has begun to accumulate. While there is some uncertainty, the best US evidence indicates that strong state accountability systems lead, in fact, to better student performance.⁹

Combining accountability with parental choice are systems that give students in schools that repeatedly do badly on the accountability test a voucher to attend private schools. In Florida, the threat of becoming subject to private-school choice has been shown to increase teacher and school performance, particularly to the benefit of disadvantaged students.¹⁰ Unfortunately, the Florida courts ruled that this approach violated the state constitution. Courts and constitutions in other states likely would not come to the same conclusion.

Curriculum-based external exit exams are another means to introduce some form of accountability into the school system. Students in countries with external-exit exam systems tend to systematically outperform students in countries without such systems. In Canada and Germany, the two federal education systems where the existence of external exams varies across regions, students similarly perform better in regions with external exams.¹¹

Choice or autonomy will not work well without a good system of student testing and accountability. Thus, the ideas about institutional structure are closely linked. The international evidence, as described below, clearly suggests that school autonomy—in particular local autonomy over teacher salaries and course content—is only effective in school systems that have external exams. For example, school autonomy over teacher salaries is negatively associated with student achievement in systems without external exams, but positively in external-exam systems. These findings reflect simple economic logic: with autonomy in decisions,

local schools might pursue other interests than just raising student achievement unless performance is public knowledge and unless that performance is measured in a consistent way across schools.

Choice and competition. Choice and competition through school vouchers were proposed a half-century ago by Milton Friedman. The simple idea is that parents, interested in the schooling outcomes of their children, would seek out productive schools, yielding demand-side pressure that creates incentives for each school to produce effective education and ensure high-quality staff in addition to a good curriculum. Schools that fail to do this could be forced to shut down, and new schools that do better could open, expand, and thrive.

In many school systems around the world (with the Netherlands being the most obvious example), privately managed schools (with public funding) provide alternatives for students. In the United States, there are limited examples of private school choice, ranging from publicly funded school vouchers in Milwaukee, Cleveland, and Washington, DC, to privately financed voucher alternatives. The evaluations of these generally show that the choice schools do at least as well as the regular public schools, if not better.

Autonomy and decentralization. Several institutional features of a school system can be grouped under the heading of autonomy or decentralization, including fiscal decentralization, local decision-making on different matters, and parental involvement. Almost any system of improved incentives for schools depends upon having school personnel in individual schools and districts heavily involved in decision-making. There is no point to incentives if people cannot respond to them. It is difficult to compile evidence on the impact of autonomy, because the degree of local decision-making is a decision for a country (or state) as a whole, leaving no comparison group within countries.

American states have varying amounts of local autonomy. One

systematic form of school autonomy is charter schools—public schools that are allowed to perform quite autonomously. (Note that these are actually hybrids of choice schools and public-school autonomy, because they survive only if sufficient numbers of students attend them.) The evidence on them is mixed, but indicates a variety of places where charter schools outperform the regular public schools after the initial start-up phase. But it also suggests in part that the regulations governing them and the particular competitive public schools they face have an influence. For example, charters in Massachusetts perform much better relative to traditional public schools while the opposite is true for charters in Indiana or Illinois, but the precise causes are unknown.¹²

Summary of Incentive Policies. One of the overarching conclusions from the evidence on incentive programs is that the policies tried so far contain no miracles that will dramatically improve the public schools. Each of the policies above has general support from the evidence; but the evidence suggests that each alone, as implemented so far, is incapable of erasing our educational problems. While some suggest that the existing changes—charters or accountability, for example—are radical reforms that may have gone too far, the evidence suggests the opposite. Not only do we have to push harder on the incentives that we know have positive impacts but also we have to actively consider truly dramatic options. As we have seen, the costs of not improving our schools are extraordinarily large, and they warrant equally as large changes in parental choice, teacher evaluations and pay, and strengthened accountability.

OTHER EDUCATION PROGRAMS AND POLICIES

The problems of K-12 performance are the most severe educational problems facing the United States. There are, however, a number of other commonly discussed issues that deserve mention. These include early childhood education, the cost of higher education, and Common Core. No attempt is made to describe

these issues completely. The objective is simply to point out some of the larger concerns.

Early Childhood Education. Considerable recent attention has gone to discussing the importance and availability of early childhood education. There are two primary parts to this discussion. First, research shows that early education is particularly valuable because subsequent learning builds on it. Second, disadvantaged children are less likely to have high-quality early childhood education than more advantaged children. Both parts are backed by evidence.

These facts, however, do not indicate the correct policies that might be pursued. In particular, the gains for early childhood programs are concentrated in poor families. Providing fully subsidized programs to all participants would be a significant transfer to middle- and upper-income families. Additionally, little is known about the elements of a high-quality program that might be more broadly run. The strongest evidence about program effectiveness (from the Perry Preschool and Abecedarian projects) comes from very expensive programs that exceed anything that might become a widespread governmental program. Effective policymaking in this area simply requires more information.

The federal government currently runs a very large early childhood program: Head Start. When evaluated, however, it has never been shown to be a very efficacious program. The most recent evaluation suggests no lasting effects from the program. Thus, a component of improved early childhood education would be a redesign of the Head Start program, including its possible complete elimination and replacement.

Higher Education. US colleges and universities are generally regarded as the best in the world, and they consistently attract top students from other countries. Two issues have received widespread publicity and discussion: access and cost.

The economic returns to completing college are very large and have grown in recent decades in many (but not all) subject

degrees. In large part, these returns reflect the development of new technologies that are more and more skill-dependent. Thus, if many people do not have ready access to college, that will have downstream implications for incomes and economic well-being.

The biggest concern about access to higher education revolves around the preparation of students for more advanced material—precisely the point of the discussions about the state of K-12 education. The largest barrier to attending and completing higher education is the lack of an earlier development of the requisite skills.

The expense side of higher education has received the most attention recently, focusing on rising tuitions and the size of loan debts. This discussion must, however, be put into perspective. The most rapid rise in tuition and fees has occurred among public two- and four-year institutions (which comprise 72 percent of the market). In real terms, between 2000 and 2012 there was a 63 percent increase in tuition and fees in public institutions (compared to a 37 percent increase in private, not-for-profit institutions).

Two observations should be made. First, at the average 2012 tuition of \$5,500 (\$7,700 in public four-year colleges), there is still a very large positive return to college for most students. It would, of course, be a larger return if the tuition were smaller, but the economic future for the typical college graduate far exceeds that of a non-completer. Second, the tuition at public institutions is only part of the cost, with the state taxpayers contributing the remaining portion. The rise in tuition reflects a changing source of funding, moving away from general taxpayers toward student-recipients of valuable higher education. Pushing states to hold down tuition means that the general taxpayers—including all those who did not receive the benefits of subsidized college education—pay a larger share and that the student-recipients get even larger subsidies. This does not seem to be good policy.

Common Core. The recent controversy over the introduction of the Common Core standards has absorbed much of the national debate on education policy. Its proponents argue that it

is important to lift the quality of education in the United States to emphasize higher-order thinking and to deliver college- and career-ready students. Further, because the US population is closely linked across states, it does not make sense to have students educated to different levels. Opponents argue that the Common Core was heavily pushed by the federal government—which should not be involved in the curriculum, legally a state function. Additionally, the Common Core standards in a number of instances seem less rigorous than those already in place in some states.

While there is considerable appeal to the idea of having high nationwide standards, there is a substantial difference between declaring what students should know and having them actually know what is in the standards. Because the debate around the existence of Common Core has become so expansive, basic policy issues have been neglected—and it is these issues that are more important in improving the learning of our students. In fact, because of the change in testing that has accompanied adoption of the Common Core, a number of states have suspended their accountability systems for teachers and schools.

On each of these policy issues—preschool, higher education, and Common Core—there has been substantial public discussion; but much of it has not been very productive in terms of improving the overall performance of the US education system. The issues may have political appeal, but political appeal does not form the basis of strong policy development.

FEDERAL ROLE

The appropriate role for the federal government warrants separate consideration. Public education in the United States is a state function, with the states also delegating much authority to local school districts. The federal government had little involvement in K-12 education until the Elementary and Secondary Education Act of 1965, when Washington pointed to education as an important part of the War on Poverty.

The primary federal government involvement in K-12 educa-

tion has focused on disadvantaged and special education students. For higher education, the federal government has emphasized aid in the form of loans and grants to students.

The federal government currently provides about 10 percent of the funding for K-12 education. It also has been heavily involved in school accountability through NCLB, which was developed in the 2001 re-authorization of the Elementary and Secondary Education Act, although that has recently changed.

What should the education role of federal government be? While the answer to this question can be somewhat controversial (as seen in the Common Core debates), it seems necessary for the federal government to pursue a few central roles.

First, Washington must take a national leadership role in promoting the importance of world-class education for the United States. This includes a bully pulpit to specify and promote what we need to achieve with our schools. It is perfectly legitimate for the federal government to help to define the goals of schools, and even the measurement of these through testing. The Common Core dispute is largely that the federal government overstepped its role by putting undue pressure on the states to adopt the federal model.

Second, the federal government should continue supporting disadvantaged and special education students. These populations are important not only from an equity/fairness perspective but also to fully develop our human capital. At the same time, these are populations that need extra resources, and the federal government should ensure their support regardless of where the populations are located. To date, the federal government has focused on mandating state actions, but it might take a page from the Florida approach of providing vouchers directly to special education students.

Third, continued support for low-income students in colleges and universities through grants and loans is by the same logic a natural role for the federal government.

Fourth, Washington should tackle the lack of reliable evidence

about programs and policies that is needed to inform education policymaking. The federal government is the natural place to locate research and evaluation activities, because states and districts across the country can all benefit from sound research on general problems. Individual states will tend to underinvest in research activities because they do not directly see the value of this research to other states. And given the size and importance of the education sector, the current amount of support for research is woefully low.

Fifth, the federal government should ensure that high-quality data are available to qualified researchers pursuing the continued expansion of policy-relevant knowledge. The quality and importance of research in education has, without question, grown, particularly spurred by the data on student outcomes that has come from administrative records. Two related issues are testing (“opting-out”) and conditions for accessing student records. Widespread opting-out of testing has the effect of destroying the usefulness of testing data for accountability and for evaluations that can improve programs.

There are also roles that are inappropriate for the federal government. NCLB highlighted this fact. The structure of NCLB essentially had the states decide what was to be accomplished by schools while the federal government specified how education should take place if schools did not produce satisfactory results. These roles are the opposite of what they should be. The federal government is in the best position to specify what needs to be produced, but it is quite unprepared to direct what 100,000 schools should do to accomplish this. The states should be given the “how” role. The Every Student Succeeds Act gives more latitude to the states, but it is yet to be seen whether the general principles of accountability for results remain solidly in play.

CONCLUSIONS

The future of the United States is dependent on the skills of its population. A basic problem is that improving these skills, which

depends on enhancing the quality of schools, takes a long and consistent policy regime. This has to come from leadership at the top.

The states have primary responsibility for the schools, but the federal government can and should be an important actor in setting the agenda and ensuring that the agenda is accomplished.