Standing on the Shoulders of Giants

An American Agenda for Education Reform

By

Marc S. Tucker

24 May 2011

National Center on Education and the Economy

Standing on the Shoulders of Giants:
An American Agenda for Education Reform

by Marc S. Tucker

This paper is the answer to a question: What would the education policies and practices of the United States be if they were based on the policies and practices of the countries that now lead the world in student performance? It is adapted from the last two chapters of a book to be published in September 2011 by Harvard Education Press. Other chapters in that book describe the specific strategies pursued by Canada (focusing on Ontario), China (focusing on Shanghai), Finland, Japan and Singapore, all of which are far ahead of the United States. The research on these countries was performed by a team assembled by the National Center on Education and the Economy, at the request of the OECD.

A century ago, the United States was among the most eager benchmarkers in the world. We took the best ideas in steelmaking, industrial chemicals and many other fields from England and Germany and others and put them to work here on a scale that Europe could not match. At the same time, we were borrowing the best ideas in education, mainly from the Germans and the Scots. It was the period of the most rapid growth our economy had ever seen and it was the time in which we designed the education system that we still have today. It is fair to say that, in many important ways, we owe the current shape of our education system to industrial benchmarking.

But, after World War II, the United States appeared to reign supreme in both the industrial and education arenas and we evidently came to the conclusion that we had little to learn from anyone. As the years went by, one by one, country after country caught up to and then surpassed us in several industries and more or less across the board in pre-college education. And still we slept.

Until US Education Secretary Arne Duncan asked the OECD to produce a report on the strategies that other countries had used to outpace us, and then called an unprecedented meeting in New York City of education ministers and union heads from the countries that scored higher on the education league tables than the United States. Now, once again, the United States seems to be ready to learn from the leading countries.

In this paper, we stand on the shoulders of giants, asking what education policy might look like in the United States if it was based on the experience of our most successful competitors. We rely on research conducted by a team assembled by the National Center on Education and the Economy, at the request of the OECD, which examined the strategies employed by Canada (focusing on Ontario), China (focusing on Shanghai), Finland, Japan and Singapore. But we also rely on other research conducted by the OECD, by other researchers and, over two decades, by the National Center on Education and the Economy.

The policy agenda presented here is not a summary of what all the nations we studied do. There are few things that all of the most successful countries do. In the pages that follow, we will point out when all appear to share a policy framework, when most do and when some do. Companies that practice industrial benchmarking do not adopt innovations only when all of their best competitors practice them. They adopt them when the innovations of particular competitors appear to work well and when they make sense for the company doing the benchmarking in the context of their own goals and circumstances. Their hope is that, by combining the most successful innovations from individual competitors in a sensible, coherent way and adding a few of their own, they can not only match the competition, but improve on their performance. That is the approach we have taken here.

We contrast the strategies that appear to be driving the policy agendas of the most successful countries with the strategies that appear to be driving the current agenda for education reform in the United States. We conclude that the strategies driving the best performing systems are rarely found in the United States, and, conversely, that the education strategies now most popular in the United States are conspicuous by their absence in the countries with the most successful education systems.

Many will be quick to point to exceptions to our characterizations of American practice. In fact, examples of excellent practice in almost every arena of importance can be found in the United States. But our aim here is not to focus on isolated examples of good practice but rather on the policy *systems* that make for effective education *systems* at scale, for it is there that the United States comes up short.

We know that the complete transformation of the whole system of policy and practice we have suggested will seem an overwhelming prospect to many people. So we turn to Canada as our best example of a country that might be used as a source of strategies for making great improvements in the short term. It seems quite plausible that, while the short term plan is unfolding, the nation might embark on the longer term agenda we suggested earlier, which would lead to even greater improvements.

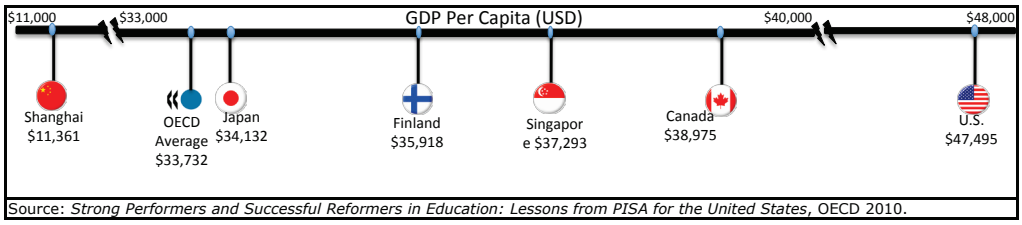
As you read this paper, bear in mind that, although we think there are useful roles that the United States government can play in improving dramatically the performance of our schools, we believe the main player has got to be state government. When we speak of changing the system, it is the states, not the national government, we have in mind.

So we begin by identifying broad themes, principles, policies and practices that appear to account for the success of some of the best-performing systems in the world.

The Broad Themes

Just below, we begin a detailed analysis of the strategies used by the countries with the most effective education systems. But it is easy to lose sight of the forest when looking at the trees.

The big story is about the convergence of two big developments. The first has to do with the trajectory of global economic development. The second has to do with the kinds of people needed to teach our children in the current stage of global economic development.



Source: *Strong Performers and Successful Reformers in Education: Lessons from PISA for the United States*, OECD 2010.

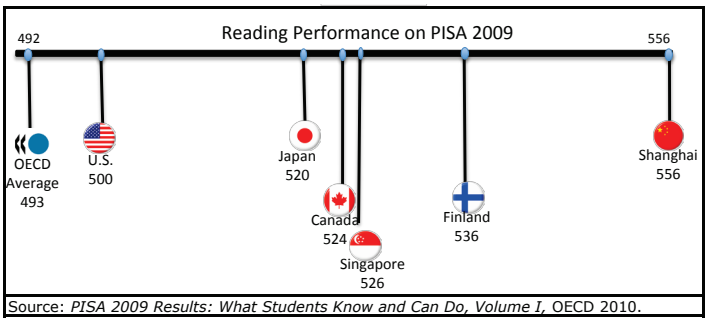
The nations we have described are either already very high wage countries or want to be very high wage countries. They have all recognized that it will be impossible to justify high relative wages for skills that are no greater than those offered by other people in other parts of the world who are willing to work for less, because we are all competing with each other now. Only those who can offer the world's highest skill levels and the world's most creative ideas will be able to justify the world's highest wages. These nations have also realized that this formulation means that very high wage nations must now abandon the idea that only a few of their citizens need to have high skills and creative capacities. This is a new idea in the world, the idea that all must have an education formerly reserved only for elites. It leads to abandonment of education systems designed to reach their goals by sorting students, by giving only some students intellectually demanding curricula, by recruiting only a few teachers who are themselves educated to high levels, and by directing funding toward the easiest to educate and denying it to those hardest to educate. It is this fundamental change in the goals of education that has been forcing an equally fundamental change in the design of national and provincial education systems.

The second big development follows from the first. No nation can move the vast majority of students to the levels of intellectual capacity and creativity now demanded on a national scale unless that nation is recruiting most of its teachers from the group of young people who are now typically going into the non-feminized professions. Recruiting from that pool requires a nation not just to offer competitive compensation but also to offer the same status in the society that the non-feminized occupations offer, the same quality of professional training and the same conditions of work in the workplace. Doing all that will change everything: the standards for entering teachers colleges, which institutions do the training, who is recruited, the nature of the training offered to teachers, the structure and the amount of their compensation, the way they are brought into the workforce, the structure of the profession itself, the nature of teachers' unions, the authority of teachers, the way they teach and much more.

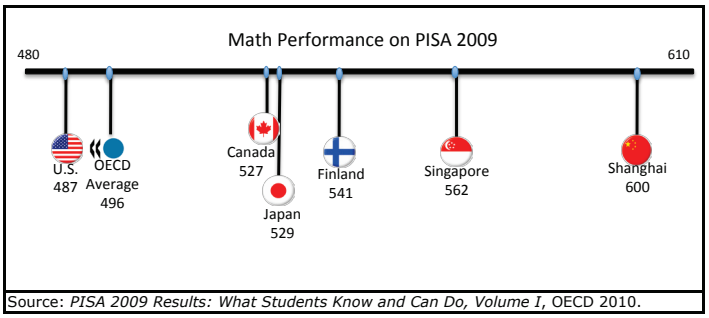
Everything that follows is a gloss on the two preceding paragraphs. If they are right, if these are the core lessons from the countries that are outperforming the United States, then much of the current reform agenda in this country is irrelevant, a detour from the route we must follow if we are to match the performance of the best. We turn now to the details.

What the Top Performers Do And We Don't

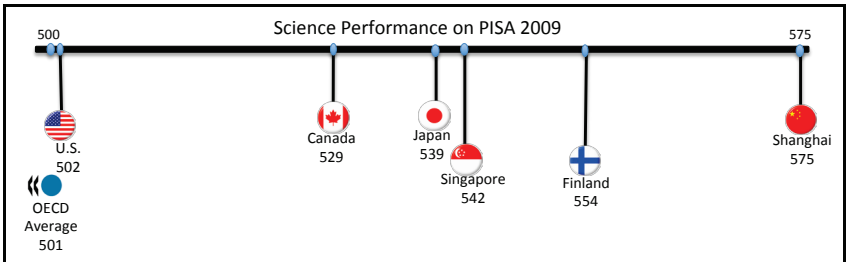
We define a high-performing national education system as one in which students' achievement at the top is world class, the lowest performing students perform not much lower than their top-performing students, and the system produces these results at a cost well below the top spenders. In short, we said, we defined top performers as nations with education systems that are in the top ranks on quality, equity and productivity. In the following section, we summarize some of the key factors contributing to first-class performance in each of these three categories. We hasten to point out that this schema is rather artificial. System features described under any one of these three categories more often than not contribute to outcomes in others. System effects abound. Nonetheless, we think this schema will prove useful to the reader.



Source: *PISA 2009 Results: What Students Know and Can Do, Volume I*, OECD 2010.



Source: *PISA 2009 Results: What Students Know and Can Do, Volume I*, OECD 2010.



Source: *PISA 2009 Results: What Students Know and Can Do, Volume I*, OECD 2010.

Before we get to the factors that most affect quality, equity and productivity, we point to the importance of international benchmarking as a key strategy for improving national education systems.

Benchmark the Best

Every one of the top performers is very conscious of what the other top performers are doing, though some benchmark more aggressively than others. The modern Japanese school system owes its very existence to trips taken by the new government when the Meiji Restoration took place, when the Japanese government resolved that the only way it could catch up with the West was to aggressively research its educational institutions and adopt and adapt the best of what they found. Japan has continued to research the education programs of the leading countries as a major input into its policymaking in education. The Singaporeans may be the most determined and disciplined benchmarkers in the world, not just in education, but across all fields of social policy. And their efforts have paid off. Finland has always made a point of researching the best performers when developing education policy. The current Premier in Ontario Province travelled abroad personally to visit other countries before settling on his new education policies for Ontario. The Hong Kong government actually hired an Australian who had done state-of-the-art work in several countries on curriculum, standards and assessment when they were looking for someone to reform their standards and assessment system.

Many Americans think that they have benchmarked other countries' education systems when they have established equivalency tables showing which scores on key American assessments correspond to certain scores on the national assessments used in other countries. But that is not what international benchmarking in education is for the countries that have been doing it for years. For those countries, to benchmark another country's education system is to compare broad goals, policies, practices and institutional structures as well as relative standing on common measures, in order to understand what another country is trying to achieve, how they have gone about achieving it, what they would have done differently if they could have done so, what mistakes they made and how they addressed them, which factors most account for their achievements and so on. Benchmarking is a wide-ranging research program that never ends, because no country's education system stands still very long.

Countries that base their education strategies on the careful study of successful strategies employed by the leading nations are not as likely to go down blind alleys wasting large amounts of resources on initiatives that fail to pay off as countries that base their strategies on untested theories, which is what the United States has tended to do over the years. What follows is a distillation of what the researchers affiliated with the National Center on Education and the Economy have learned since 1989 from the countries with the best education systems, with a particular focus on the countries, provinces and cities highlighted in this paper.

Design for Quality

Getting the Goals Clear

Reading the official documents from the ministries of the top-performing countries, and listening to the top officials in those countries, one cannot help but be struck by the attention that is being given to achieving clarity and consensus on the goals for education in those countries. It is probably no accident that Finland, Japan, Shanghai and

Singapore are without physical resources. All of these places have known for a very long time that their standard of living depends entirely on the knowledge and skills of their people. All now realize that high wages in the current global economy require not just superior knowledge of the subjects studied in school and the ability to apply that knowledge to problems of a sort they have not seen before (the sorts of things that PISA measures), but also a set of social skills, personal habits and dispositions and values that are essential to success. The Asian countries in particular are concerned that their students may not have as much capacity for independent thought, creativity and innovation as their countries will need. Though all these countries are concerned about developing the unprecedented levels of cognitive skills and non-cognitive skills required by the global economy, they are no less concerned about social cohesion, fairness, decency, tolerance, personal fulfillment and the transmission of the values that they feel define them as a nation. In many cases, these discussions of national goals have laid the base for sea changes in the design of national education systems, providing a solid foundation in national opinion for the kind of political leadership needed to redesign institutions that are—and should be—very hard to change. Not since the formation of the National Education Goals Panel in 1990, more than 20 years ago, has there been a focused discussion of America's goals for its students of the sort that many of these other countries have had more recently.

Instructional Systems and Gateways

Virtually all high-performing countries have a system of gateways marking the key transition points from basic education to upper secondary education, from upper secondary education to university, from basic education to job training and from job training into the workforce. At each of these major gateways, there is some form of external national assessment. Among the countries we studied, only Canada does not have such a system. Among the top ten countries in the PISA rankings, Canada is again the only outlier.

The national examinations at the end of upper secondary school are generally—but not always—the same examinations that the universities in that country use for entrance examinations. In many countries, these examinations are the only thing taken into account in determining who is admitted to which university and to the programs or schools within the university. It is also true, in many of these countries, that the scores on one's exams determine whether one will be admitted to upper secondary programs designed to prepare the student for admission to university. The content of the upper secondary exams is usually determined by the university authorities, and is closely tied to the content of the upper secondary curriculum. It is also typically true that there is an upper secondary program available to students who have successfully completed their basic education by the end of grade nine or ten that is intended to provide training for students who will either enter the job market when they complete it or go on to a polytechnic school for advanced technical training. The standards for the examinations at these gateways are typically set by the state in close collaboration with representatives of the industries that will employ the graduates, and, in some cases, with representatives of the labor organizations in those industries.

In the systems just described, there is very close alignment between the upper secondary curriculum, the upper secondary exams, and the university requirements. There is also very close alignment between employer's requirements and the skills students acquire to prepare for work in the industries in which they seek jobs. And finally, in these systems, regardless of which path a student decides to take in upper secondary education, they must all meet a common basic education standard aligned to a national or provincial curriculum before moving on to upper secondary school.

In countries with gateway exam systems of this sort, every student has a very strong incentive to take tough courses and work hard in school. Students who do not do that will not earn the credentials they need to achieve their dream, whether that dream is becoming a brain surgeon or an auto mechanic. Because the exams are scored externally, the student knows that the only way to move on is to meet the standard. Because they are national or provincial standards, the exams cannot be gamed. Because the exams are very high quality, they cannot be 'test prepped'; the only way to succeed on them is to actually master the material. Because the right parties were involved in creating the exams, students know that the credentials they earn will be honored. When their high schools say they are "college and career ready," colleges and employers will agree.

But the power of this system does not end there. In the countries that have some form of the system just described, the examinations are set to national standards and are directly derived from a national curriculum. Teachers in those countries are taught to teach that curriculum. It is also the case that these countries work out a curriculum framework, which means they decide, as a matter of policy, what topics should be taught at each grade level (or, in some cases, pair of grade levels) in each of the major subjects in the curriculum. In this way, they make sure that each year the students are taking the material that will be prerequisite to the study of the material that they are supposed to master the following year and all students will be ready for advanced material when it is offered. In these countries, the materials prepared by textbook publishers and the publishers of supplementary materials are aligned with the national curriculum framework.

Thus the standards are aligned with the curriculum, which is aligned with the instructional materials available to teachers. And the examinations are also aligned with the curriculum, as is the training that prospective teachers get in teacher training institutions.

In all of the countries studied for this paper, the national curriculum goes far beyond mathematics and the home language, covering, as well, the sciences, the social sciences, the arts and music, and, often, religion, morals or, in the case of Finland, philosophy. In most of these countries, few, if any, of the upper secondary school examinations are scored by computers and much of the examination is in the form of prompts requiring the student to work out complex problems or write short essays. They do this because the ministries in these countries have grave doubts about the ability of computers to properly assess the qualities they think most important in the education of their students.

Perhaps most important, the curricula and examinations in every country studied for this report, save Canada, were set not just to a very high standard, but to a particular kind of standard. Their students did well on the PISA examinations because they demonstrated high mastery of complex content as well as the ability to apply what they learned to practical problems of a kind they were not likely to have practiced on. Shanghai, Japan and Singapore have in recent years all engaged in multi-year massive revisions of their curricula to see if they could strike the right balance between high-level content mastery, problem-solving ability, and the ability to demonstrate a capacity for independent thought, creativity and innovation. Finland, having produced an elegant curriculum specification years ago for every level of their school system, has been making it less voluminous, in an effort to find the right balance between specificity and flexibility for their teachers.

The level of detail at which the national standards and curriculum are specified varies widely. In most of the East Asian countries, they are fairly detailed. In Finland, as just noted, they have been getting progressively briefer. In all cases they are guidelines, and in no case do they get down to the level of required lesson plans. They typically give teachers considerable latitude with respect to the specific materials used, pedagogy and pace.

It is important to point out that the United States has, in this realm, something that these other countries do not have, and it is not entirely clear that it is a good thing. The idea of grade-by-grade national testing has no takers in the top-performing countries. These countries do national testing at the gateways only, and some do not do state or national testing at every gateway. Typically, there are state or national tests only at the end of primary or lower secondary education, and at the end of upper secondary school. Schools and the teachers in them are expected to assess their students regularly as an indispensable aid to good teaching, but the assessments given between gateways are not used for accountability purposes, as the basis of teachers' compensation or to stream or track students.

Nonetheless, what has just been described is a very powerful instructional system that has few parallels in the United States. For a long time, Americans have preferred 'curriculum neutral' tests to those aligned with curriculum, virtually guaranteeing that students would be measured on a curriculum the teachers had not taught. Schools of education had no obligation to teach prospective teachers how to teach the national or state curriculum, because there was no such thing. Because the states had no curriculum frameworks, textbook manufacturers put a vast range of topics in their textbooks, knowing that any given topic might be taught by teachers at many different grade levels, and gave each of those topics only cursory treatment, because so many topics had to be included in the text. The federal government now requires tests in English and mathematics at many grade levels and has tied important consequences to student performance on those tests, thus heavily biasing the curriculum toward the teaching of these subjects and away from the teaching of other subjects in the curriculum that these other countries view as critical. Whereas these top-performing countries have placed a high value in their national policies on the mastery of complex skills and problem solving at a high level, the United

States has in recent years emphasized mastery of basic skills at the expense of mastery of more advanced skills. We continue to prefer tests that are largely based on multiple choice questions and that are administered by computers.

The new Common Core State Standards for mathematics and English and the work being done by the two assessment consortia will begin to address some of these issues, but, even when that work is done, the United States will still be at an enormous disadvantage relative to our competitors. We will have tests in these two subjects that are still not squarely based on clearly drawn curricula. The two consortia are betting heavily on the ability of computer-scored tests to measure the more complex skills and the creativity and capacity for innovation on which the future of our economy is likely to depend. No country that is currently out-performing the United States is doing that or is even considering doing that, because they are deeply skeptical that computer-scored tests or examinations can adequately measure the acquisition of the skills and knowledge they are most interested in. If the United States is right about this, we will wind up with a significant advantage over our competitors in the accuracy, timeliness and cost of scoring. If we are wrong, we will significantly hamper our capacity to measure the things we are most interested in measuring and will probably drive our curricula in directions we will ultimately regret.

In any case, if the interstate consortia continue to measure performance only in mathematics and English (with the eventual addition of science), we will have no multi-state curriculum and assessments in the other subjects in the curriculum for which many other countries have excellent assessments. It is unclear to what extent there will be strong curriculum and related instructional materials available to support the new tests in math and English, to say nothing of the other subjects in the broader core curriculum or subjects that cut across the curriculum. Nor is it clear to what extent our schools of education will assume responsibility for preparing teachers to teach the curriculum that emerges from the new Common Core State Standards efforts.

All of this is to take nothing away from the enormous achievement that is represented by the Common Core State Standards. But it is important to recognize that the development of the kind of complex, coherent and powerful instructional systems just described took many years to develop and improve in the countries we have studied. There is little doubt that these systems now constitute one of the most important reasons for their excellent performance. Implementation of the Common Core State Standards will still leave the United States far behind in what is undoubtedly one of the most important arenas of education reform. It will be essential to continue, to expand, and to expedite that work.

Teacher Quality

What we mean by 'teacher quality'

There is a good deal of discussion now about teacher quality, but it is not clear that there is much consensus as to what is meant by that term. But it is possible to derive a tripartite definition of teacher quality from the experience of the five countries we

studied: 1) a high level of general intelligence, 2) solid mastery of the subjects to be taught, and 3) demonstrated high aptitude for engaging students and helping them to understand what is being taught. We will take each in turn.

Some law firms in the United States recruit only from a handful of top universities. Others are happy to take graduates from the local night law school. The former firms recruit from the most elite universities not because they believe those universities do a better job of teaching the specific skills they are looking for but because they are using the university selection system to do their screening for them on some other qualities they care very much about. They are looking for people of outstanding general intelligence who also have the drive, tenacity and capacity for hard work that it takes to get into and survive the top law schools. They know that such people will quickly learn on the job what they need to know to do the specialized work they will be assigned. They know that, everything else being equal, they can count on such people to outperform their competitors on a wide range of assignments. They will be able to function with less supervision. They will produce better work. They will rise up the ladder of responsibility faster. The Japanese call this bundle of qualities "applied intelligence." Companies of all kinds in all industries will go as far up the applied intelligence scale as they think they can afford to secure a competitive advantage in their markets.

When a country is in the preindustrial stage or in the throes of a mass production economy, few workers will need advanced skills, and most students will not need much more than the basics. But, in advanced post-industrial economies, a much larger portion of the workforce needs to grasp the conceptual underpinnings of the subjects they study in school. They need more advanced knowledge. They need to be fluent at combining knowledge from many different fields to solve problems of a kind their teachers never anticipated. One can only do this with a much deeper and more advanced knowledge of the subjects in the core curriculum than used to be the case. And deep subject matter knowledge is not enough, either. They will have to be able to synthesize established and new knowledge quickly, analyze problems quickly and from odd angles and synthesize the knowledge they need in unusual ways to come up with creative and often unique solutions. They will need good taste as well. The students will not have that knowledge, those skills and the other attributes just mentioned if their teachers lack them. As we will see below, the top-performing countries are making strenuous efforts to greatly improve the subject matter knowledge of their teachers as well as their ability to analyze and synthesize what they know. So deep subject matter knowledge as well as the ability to use that knowledge effectively is the second requisite.

But one may be good at physics and still be a poor physics teacher. To be good at teaching, one has to be able to connect with students, to engage them, inspire them, communicate easily with them, get inside their heads and figure out what they don't understand and find a way to help them understand it. And it is not all about conveying 'content.' It is also about helping students to understand what the right thing is and why it is important to do it when doing it is not easy. It is about persuading a student that she has what it takes to go to college or stay in high school when her dad just went to jail and she is living on the sidewalk. It can be about being a friend, a mentor and a guide.

Most of the countries we studied have made strenuous efforts to raise the quality of their teachers in each one of these dimensions. The strategies they have used are sometimes very similar and sometimes very different.

Quality of the pool: Status, Compensation, Professional Working Conditions

Organizations that care about the quality of their workforce know that the single most important factor in that calculus is the character of the pool from which it recruits. No private firm, much less an entire industry, would prefer to recruit its professional staff from the least able college graduates if it could do better than that.

Three things directly affect the quality of the pool from which a nation recruits its teachers: 1) the status of teaching in the eyes of the potential recruit, relative to the status of other occupations to which he or she aspires, 2) the compensation offered, relative to other possible choices, and 3) the conditions of work, meaning the degree to which the way the work is organized makes it look more like professional work than blue-collar work.

It turns out that the countries with the most successful education systems are using a whole set of connected strategies to address all of these factors at the same time that they are addressing the need to get the teachers with the highest possible applied intelligence, the deepest content knowledge and the best teaching ability. Here's how they are doing that:

Standards for entry to teacher education

The logic for raising standards for getting into teacher education programs is the same everywhere. Low standards for entry means that people who could get into professional programs perceived as hard to get into see teaching as attractive only to people who do not have the skill or ability to do anything else, so they do not want any part of them. If these schools and programs are easy to get into, the message in the college or university is that they are low status and so higher education faculty who can get higher status jobs in their institutions do not want to teach in the education programs. Raising the standards for admission will attract a higher quality of applicant, and, at the same time, discourage lower quality applicants, and it will also attract a higher quality faculty, which also attracts a higher quality applicant.

So at this stage of the process, when applicants for teacher education programs are being considered for admission, quality means scores on common, highly regarded measures of general intelligence such as, in the United States, the ACT and the SAT; high scores or grades in courses in the subjects the applicant plans to teach; and high scores on relevant indicators that show the candidate has the personal attributes needed to connect with, inspire and support children of the ages he or she plans to teach.

We pointed out earlier that the Japanese have had high standards for entry into the teaching profession since the days of the Meiji Restoration more than a century ago.

Shanghai has raised their standards for entry into higher education programs intended to prepare teachers. Below, we describe how two other top performers go about making these determinations.

In Singapore, young people for a long time have taken "A Level" exams to get into teachers college. These are very difficult end-of-course examinations built on the English model. Low scores on these exams used to be sufficient for aspiring teachers, but, in recent years, that is no longer true and scores in the middle of the range are now required. Alternatively, the candidate can now present a polytechnic diploma, which is roughly equivalent to a high-level college degree in the United States. This is an even finer screen, because the polytechnics are in the top of the status hierarchy of the Singapore higher education system. In addition, the successful candidate must also survive a demanding interview conducted by a panel including National Institute of Education faculty, chaired by a serving or retired principal. The panel is charged to find out whether the candidate has the passion, commitment, communication skills, empathy and disposition to be a good teacher. Only one out of eight applicants survive this whole process.

In Finland, applicants for admission to teachers college who are accepted must survive a two-stage review. The first stage is a document review. To make it through this stage, they must: 1) score very high on the national college entrance exams, 2) have a high grade point average on their high school diploma and 3) have a strong record of out-of-school accomplishments while in high school. In the second phase they must: 4) complete a written exam on assigned books in pedagogy, 5) interact with others in situations designed to enable a skilled observer to assess their social interaction and communication skills, and 6) survive interviews in which they are asked, among other things, to explain why they have decided to become teachers. They are admitted to a teacher education program only after they have passed all of these screens. Only one out of ten applicants for entry into Finnish teachers colleges are admitted.

Thus two of the countries with the highest scores on the 2009 PISA have both instituted rigorous measures used to determine entrance into teacher preparation programs intended to assess all three of the components used to define teacher quality at the beginning of this section. The effect of these rigorous measures is to limit Singapore's intake to the top 30 percent of high school graduates and to limit Finland's intake to the top 20 percent.

It is a different story in the United States. The College Board reported in 2008 that when high school graduates going on to college were asked what their intended major was, those who had decided on education scored in the bottom third on their SATs. Their combined scores in mathematics and reading came in at 57 points below the national average.

This should not surprise us, because, in our country, most schools of education at both the undergraduate and graduate levels are widely regarded as very easy to get into. Their status within the university is typically among the lowest of all schools and departments.

This was often the case in the best-performing countries not so long ago, before they began their march to their present much higher rankings.

There is, of course, a shining exception to this broad generalization, which is Teach for America, which famously enrolls very high-performing graduates of many of the most elite colleges in the United States and then assigns them to teaching positions in schools serving disadvantaged students. But Teach for America only serves to underscore the point being made here. The proportion of openings for new teachers every year in the United States filled by Teach for America participants is vanishingly small, and, in any case, most have no interest in continuing as career teachers after they have satisfied the initial requirement anyway. Teaching is viewed by many Teach for America participants as the equivalent of a tour in the Peace Corps, not as a serious career opportunity. The experience of Teach for America makes it plain that it is possible to attract the very best and brightest to teaching, but Teach for America does not itself provide a path to staffing our schools with highly capable teachers for the time and in the numbers needed. Teach for America is not an alternative to building schools of education that can attract first rate candidates and teach prospective teachers what they will need to know to be successful in our schools.

It has not always been this way. There is reason to believe that the standards for admission to teacher education programs in the United States were once considerably higher.

In fact, there is reason to believe that the problem with the American teaching force is not that it has long been of low quality and must now be raised, but rather that the United States greatly benefitted for the better part of a century from having a teaching force largely made up of college-educated women whose choice of career was largely limited to nursing, secretarial work and teaching, and some minorities whose career choices were similarly constrained. Many women chose teaching because it would allow them to be home when their children came home from school. Because career choices were so limited, the American public reaped the twin blessings of a highly capable teaching force willing to work for below-market wages under poor working conditions. Those who accepted that deal are now leaving the workforce in droves. There are now more women than men in the professional schools preparing young people for many of the most prestigious professions and they are taking advantage of those opportunities. The United States is now about to get the least capable candidates applying to our education schools when we need the best.

When we had a higher quality candidate applying to our teachers colleges, the colleges could afford to be more selective. That is why there is good reason to believe that the standards for entry into teacher education have been sliding. When the baby boom was leaving our colleges, many people predicted that the coming baby dearth was going to result in great reductions in the size of college student bodies as the size of the whole cohort declined massively. But, though the size of the cohort certainly declined, the size of student bodies did not. The data suggest that the colleges made a fateful decision to lower their standards to fill their classrooms. There is every reason to believe that this

happened in our teachers colleges in just the same way it happened in other colleges, but it was also at this time that opportunities for women and minorities greatly expanded, which would mean that the quality of applicants in teachers colleges would have suffered from both of these causes, not just one. Furthermore, analysts are now noticing a large falloff in applications for admission to teachers colleges all over the country, a result of the financial crisis. Potential candidates, who used to view teaching as almost immune from the business cycle and therefore one of the most secure of all occupations, are noticing that teachers are being laid off in very large numbers and now see teaching as a very risky bet.

Put these three points together—highly qualified college educated women and minorities abandoning teaching as a career, the drop in admission standards following the baby boom and the decision by many capable students to avoid teaching because of the widespread teacher layoffs, and we can see the danger ahead for the United States. All we need to do to acquire a very poor teaching force is nothing. Inaction, not action, will bring about this result. It is critical that this trend be reversed. We cannot afford to continue bottom fishing for prospective teachers while the best performing countries are cream skimming.

Attracting top flight students to teacher education and a career in education—the compensation angle

Most of our competitors have formal policies that peg teachers' compensation to the top ranges of their civil servants' compensation system or to the compensation of other professionals, such as engineers, in the private sector. Their aim is to make sure that young people making career choices see teaching as offering compensation comparable to that offered by the more attractive professions. Finland's teachers appear to get paid a little less, relatively speaking, than teachers in the other top countries, but, because salaries for everyone are very flat in Finland compared to most other countries, and the status of teachers is so high, they still get excellent candidates.

At the International Summit on the Teaching Profession convened by Secretary Duncan in New York City in March 2011, the Minister of Education of Singapore offered the observation that the goal of compensation policy ought to be to "take compensation off the table" as a consideration when able young people are making career decisions. There was wide agreement on that point among the ministers of the other top-performing countries around the table.

The United States is far from the Singapore minister's standard. According to the National Association of Colleges and Employers, teachers earn a national average starting salary of $30,377. That compares with $43,635 for computer programmers, $44,668 for accountants and $45,570 for registered nurses. None of these occupations are among the leading professions, which provide starting salaries that are even higher. Not only do teachers make markedly less than other occupations requiring the same level of education, but census data shows that teachers have been falling farther and farther behind the average compensation for occupations requiring a college degree for 60 years.

The average earnings for workers with college degrees are now 50 percent higher than average teachers' salaries, which is a very long way indeed from the Singapore minister's standard.

Making sure that initial and average compensation for teachers is competitive is essential. But there are other issues having to do with compensation and financial incentives for choosing teaching as a career that other nations have addressed and we have not.

Shanghai, for example, has waived its charges for tuition for teacher education and offered early admissions to students applying to teacher education programs. This has made teaching a very attractive career choice, especially for students from the poorer provinces with strong academic backgrounds. Though the compensation for teachers in China is low by international standards, teachers in that country can make substantial additional income from tutoring. And the government also offers bonuses to teachers willing to teach in rural areas. The result of these and other initiatives has now made teaching the second or third most popular career choice in China, a very recent development.

It is obvious on the face of it that if compensation is not adequate, raising standards for admission to teacher preparation programs in universities, raising the standards for licensure and refusing to waive those standards in the face of teachers' shortages will simply guarantee shortages of teachers into the indefinite future.

It turns out that total compensation of teachers is more competitive than cash compensation taken by itself, because American teachers' compensation, like that of civil servants generally, is heavily weighted toward retirement benefits. Costrell and Podgursky report that, in 2008, employer contributions to teachers' retirement plans was 14.6% of earnings, compared to 10.4% for private professionals, this difference having more than doubled in the four years since the data were first collected. The problem with this is that, while it provides a strong incentive for experienced teachers to stay in teaching longer than they might otherwise, it makes teaching unattractive to young people who are more concerned about supporting new families than about their retirement.

The trajectory of cash compensation is also important. Most American teachers top out quickly. And, even when there are adjustments for differences in the quality of teaching, which is very rarely done, they are very small. Countries that are restructuring teachers' careers are adjusting compensation as teachers ascend career ladders within the profession and in administration, and take on more authority and responsibility as they do so. We have also seen that some countries—again, Singapore is a good example—are paying bonuses of up to 30 percent to teachers who are found to be particularly effective on a wide range of measures. And many of those countries, not just China, are paying more to teachers who are willing to work in outlying areas or who bring qualifications in short supply.

Institutional setting

As late as the 1970s, Finnish teachers were prepared in relatively low status colleges dedicated to teacher education. Now, all their teachers are educated in their major universities. This was not accomplished by simply allowing the former teachers colleges to become universities, but by sending prospective teachers to institutions with the highest status in the postsecondary system.

Years ago, prospective teachers in Singapore were also trained in a separate and relatively low status college for teaching. Then, Singapore created the National Institute of Education to train its teachers. More recently, the government incorporated the NIE into Nanyang Technological University, a top tier institution in Singapore's higher education system. Nanyang has partnerships with many of the world's most highly regarded research universities and is ranked by *The Economist* as having one of the best business schools in the world. NIE is now a major research institution in its own right, and, at the same time, a very high status part of Singapore's postsecondary education system.

Thus many of these top-performing countries have not only greatly raised their standards for getting into higher education institutions preparing teachers, but most have moved teacher education out of their lower tier institutions and into their top tier institutions. This has had the effect of further raising the status of teaching, improving the quality of faculty, improving the quality of research on education, facilitating the dissemination of high quality research to prospective teachers and creating a teaching force that is less likely to put up with old forms of work organization once they become school teachers.

Teacher education in the United States is no longer done in institutions called normal schools, but it is generally done in second and third tier, relatively low status institutions, many of which were formerly normal schools. When it is done within major universities, it is typically accorded the low status associated with the other feminized occupations. While graduate education in education is often done in the major research universities, many of the institutions that offer professional training in school administration and education research do not offer professional training to school teachers. This is very similar to the profile that many of the leading countries abandoned ten or more years ago.

Content of teacher education and induction

We combine here two functions usually thought of quite separately: what prospective teachers are taught about their craft before entering service and what they are taught immediately after entering service. The reason we have done that is that some top-performing countries rely heavily on pre-service teacher education to teach the skills of the craft to teachers and some put much more emphasis on the use of apprenticeship-style instruction in the workplace to convey the essential craft skills, once the teacher has been hired by the schools. This is an important difference.

Consider first the approach taken by Finland. The Finns, as we have seen, require all of their teachers, including their primary school teachers, to have a master's degree. Primary

teachers major in education, but they must minor in at least two of the subjects in the primary curriculum. These minors are taken not in the education schools but in the arts and sciences departments of the university. Upper grade teachers must major in the subject they will be teaching. Their education in pedagogy is either integrated into their five-year program or provided full time in the master's year after the student has completed a bachelors program with a major in the subject that person will teach. Candidates who already have a master's degree in the subject they will teach must get another master's degree in teaching. There are no "alternative routes" to entering the teaching force in Finland. The only way to become a teacher in Finland is to get a university degree in teaching.

Clearly the Finns place a very high value on having teachers who have really mastered the subjects they will teach, and have also placed a high value on giving teachers the skills they will need to teach those subjects well once they arrive in the classroom.

Now consider the approach taken by Shanghai. In Shanghai, 90 percent of the teacher preparation program is devoted to mastery of the subject the prospective teacher will be teaching. A school mathematics teacher in training is expected to take the same undergraduate mathematics curriculum as undergraduates who will go on to do graduate work in mathematics, a very demanding curriculum.

It is clear that the Shanghai authorities are at least as determined as the Finns that the teachers who go on to teach science or any other subject know as much about the content of those subjects by the time they complete their undergraduate program as the people who will go on to be physicists or chemists or mathematicians know about those subjects when they complete their undergraduate program. And that is just as true of their future elementary school teachers as it is of their secondary school teachers.

The comparison with American policy and practice on the same point is very telling. Whereas elementary school teachers in these two other countries specialize in math and science or in social studies and language, Americans preparing to become elementary school teachers do not. Most American elementary school teachers know little math or science and many are very uncomfortable with these subjects. That is hardly true of their counterparts in Finland or Shanghai. And some of our secondary school teachers of math and science know a good deal less than their counterparts in those countries. It is also true that once one becomes a teacher in the United States, irrespective of the arena in which one is trained, a teacher can be assigned to teach a subject in which he or she was never really trained at all.

An anecdote related to this point is worth telling. Some years ago, Bill Schmidt, among the most distinguished of Americans who have been benchmarking the performance of the leading nations over the years, and who led the American team working on the TIMSS studies, was in a meeting with his other colleagues from the countries designing the tests and research studies. One of the Americans made a pitch for including a background question in the research instrument that would have asked how many teachers of mathematics and science in each country were teaching subjects they had not

been prepared to teach. There was an expression of astonishment from the representatives of all the countries except those from the United States. It simply was not done. Teachers were not permitted to teach outside their subject. There was no need to ask this question. The topic was never raised again. Evidently, only the United States, among all the industrialized countries, allows its teachers to teach subjects they have not been highly trained in.

The cumulative result of these differences is a much greater likelihood that, from the first grade to the last, school children in Shanghai and Finland are likely to be taught by teachers who have a better command of the subjects they will be teaching. The consequences of these differences are incalculable.

We come next to the question of policy and practice concerning the standards to be met by teachers in Shanghai, Finland and the United States with respect to pedagogy. It turns out that this is a very important issue in both Finland and Shanghai, but the strategies for achieving excellence in this important arena are very different in these two countries.

The Finns place most of their faith in developing the pedagogical skills of their future teachers while they are still in pre-service training. Obviously, the Finns believe it is very important for prospective teachers to get a strong background in pedagogy before entering the teaching force. They provide a strong background in the research underlying teaching and they also provide their teachers with strong research skills. All teacher candidates have to complete a research-based dissertation. Prospective teachers are expected to learn a lot about subject-specific pedagogy. There is considerable emphasis in the teacher education curriculum on the development of the candidate's skills at diagnosing student problems and learning how to choose the right solution for those problems, based on the relevant research. And there is a very strong clinical element in the program, including a full year of practice teaching done under the close supervision of a master teacher.

Whereas the Finns take five years or more to educate a teacher and divide that time almost equally between content training and pedagogical training, the Chinese, as we just saw, devote 90 percent of the available time during pre-service training to deep mastery of the subject the prospective teacher is preparing to teach. The remaining time available for teacher education—only 10 percent of the total—in Shanghai is devoted to a program of instruction in education theory, the psychology of learning and teaching methods that has not changed in many years and which many observers think is very out of date.

At first glance, that would appear to suggest that the Finns believe in the importance of substantial instruction in pedagogy and the Chinese think it unnecessary. But that is not the case. In Shanghai, a new teacher is expected to spend the first year of employment as a teacher under the intense supervision of a master teacher. Their master teachers are relieved of all or most of their classroom responsibilities to allow them to play this role. These master teachers often sit in on every lesson taught by the new teacher, providing intense coaching. And the new teacher will also observe the master teaching many lessons, too.

Recall that the Finns have decided that it is essential that their prospective teachers learn as much as possible about how to diagnose the nuances of the difficulties students experience in mastering difficult material, as well as how to identify the right techniques and methods to address those problems. The Finns put a lot of effort into building their prospective teachers' skills in this arena before they enter service. The Chinese are no less concerned than the Finns that their teachers master the art of teaching, but they have a very different strategy for accomplishing this aim. They put most of their faith in a very demanding apprenticeship strategy, as soon as the teachers-college graduates are hired.

Both countries devote a lot of resources to the development of the pedagogical skills of their recruits. It is certainly true that American schools of education teach methods courses. But American teachers complain constantly that what they learn in these courses is of very little value when they enter real classrooms. By all accounts, the efforts of the Finns and the Chinese to give their prospective teachers and beginning teachers much better supported initial classroom experience, at the hands of master teachers who can build their skills at recognizing specific problems that students have in learning the subjects they will teach and figuring out which research-based techniques are appropriate to address those problems, is an important key to those countries' success.

The careful attention to the development of skills in diagnosis and prescription, in the development of effective lessons, in the adjustment of instruction to the actual needs of students, under the extended and intensive guidance of master teachers, has no counterpart in the American experience. Little attention is typically devoted to detailed instruction in diagnosis and prescription, except, in some instances in the case of special education. The typical clinical experience of American candidate teachers is usually of poor quality, too brief, unconnected to the rest of their instructional program and provided by classroom teachers who cannot on the whole reasonably be called 'master teachers.' Once graduated from teachers colleges and hired by their first school district, they are typically put in a sink or swim situation, with little or no support from experienced teachers or supervisors, often in the most demanding classroom situations. Once again, the contrast with the experience of their Shanghai and Finnish colleagues could not be more stark.

It is worth pointing out, however, that the training of American medical doctors rests firmly on the very elements just described as the basis of the training of Finnish and Shanghai educators. American medical doctors are supposed to have a thorough background in the sciences that underlie medicine, physiology and pathology. Their training is essentially clinical in nature and is provided by master practitioners. The heart of the training is a form of apprenticeship known as rounds and residency. The most important aspect of their training is skills in diagnosis and prescription, based on a firm knowledge of the relevant research. This training takes place not in third tier, low status institutions, but in professional schools in top research universities. Most of these features have been adapted to the needs of professional education in teaching by most of our top competitors. None yet typify American practice.

Licensure and standards for entry

When teachers' shortages develop in the United States, the government's response is almost always to waive the regulations defining the minimum qualifications for teaching in public schools. When there is a shortage of civil engineers, we do not say that it is no longer necessary to make sure that civil engineers have the qualifications needed to design safe bridges nor, in such situations, do we decide that doctors no longer need to meet the minimum requirements for licensure. If there is a shortage in those fields, or indeed in virtually all truly professional fields, compensation increases until the market clears and the shortage disappears. There is no clearer sign of society's lack of respect for teachers and teaching than its view that, in the end, what really matters is having a warm body in front of their children, irrespective of that person's qualifications to teach. The best performing nations do not do this. They do not have to. They have, as we have seen, many more fully qualified applicants for teaching positions than positions available.

Continuing professional development: the instruction connection

It would not ordinarily come naturally to most Americans to combine these two topics, but that may be part of our problem, because it would come quite naturally to educators in many of the top-performing Asian countries.

Consider the Japanese practice of lesson study. In Japanese schools, the faculty work together to develop new courses or redesign existing courses to make them more engaging. Once developed, that course is demonstrated by one of the teachers and critiqued by the others and revised until the faculty is happy with it. Then a particularly capable teacher will demonstrate it for others and critique their practice when they in turn teach it. Throughout, the development process calls on the latest research. Teachers who get very good at leading this work are often called on to demonstrate their lessons to other schools and even to teachers in other districts and provinces. In this way, instructional development and professional development are merged and professional development becomes an integral part of the process of improving instruction in the school, informed by the latest and best research.

In fact, Japanese teachers are provided with research skills in their pre-service training, so that this local, teacher-led development process is supported by the kind of research skills needed by teachers to make sophisticated judgments about the effectiveness of their local development work.

In the United States, teachers are generally the objects of research rather than participants in the research process itself. The topics for professional development are often chosen by administrators in the central office rather than by teachers seeking to improve their own practice on terms of their choosing. Because the topics chosen for professional development are typically not the topics the teachers would have chosen, they often perceive the professional development they get as not particularly helpful. The Japanese model just summarized is certainly not the only model used in the top-performing

countries, but it suggests the possibilities that come to mind when teachers are viewed as highly competent professionals who are expected to take the lead in defining what good practice is, advancing that practice and keeping up to date on the latest advancements, which is exactly what happens in the professions that are led by the members of the profession rather than those who are administratively responsible for their work.

Continuing professional development: the career development connection

All over the world, well run companies and government agencies give a lot of thought, not only to how they can source their staff from the most capable pool possible, but also how they can offer their best people attractive careers in the agency or company, careers of increasing responsibility and authority, and the increased compensation and status that come with those jobs. Typically, they carefully groom their most promising staff for the next steps on the ladder, giving them at each stage the training they will need for the next job, providing mentors who can help them develop the right skills and so on.

That is what Singapore does for its professional educators. Having done their best to make sure that they have a very talented pool from which to source their teachers, they recruit the best and then provide top-level training for them. But it does not end there. They have carefully structured several distinct career lines that are available to the new recruits. For each career line, they have designed programs of training that are matched, step by step, to each step of the ladder. The system selects those people for further training who have the best qualifications, get the best ratings and have done the best in the training for the next position. In this way, Singapore carefully nurtures its talent pool, reserving the most expensive training for the people best prepared to use it well.

When teachers in Singapore are first hired, they become eligible to choose among three possible career ladders. One leads to the position of Principal Master Teacher through the intermediate steps of Senior Teacher, Lead Teacher, Master Teacher and, finally, Principal Master Teacher. That is the "Teaching Track." Teachers who want a career in administration proceed through Subject Head/Level Head, Head of Department, Vice Principal, Principal, Cluster Superintendent, Deputy Director, Director, and lastly, Director-General of Education, the top spot. That is the "Leadership Track". And there is another track, called the "Senior Specialist Track," designed to describe the trajectory of a career in the Ministry of Education in various specialized areas such as curriculum and instructional design, and education research and statistics. Highly qualified candidates for advancement in this system may be offered scholarships for advanced study in Singapore and abroad, in leading universities all over the world. They may be deliberately rotated among carefully selected assignments in the schools in the Ministry to give them the kind of experience the Ministry is looking for.

It is fair to say that neither the United States nor the individual states have policies designed to create a high quality pool from which we select candidates for teacher training. We often take whoever shows up. The pool is self-selected. With rare exceptions, we do not have well-defined career paths for teachers who want to advance their careers, but stay in teaching. Nor, obviously, have we defined the training and

further education that candidates for advancement on that nonexistent path must complete to be eligible for advancement. Indeed, we have not defined, as the Singapore government has, what qualities we are looking for in teachers that would qualify them for advancement.

•

This section on teacher quality is one of the longest in this paper and it is easy to lose the thread. But there is one.

We see two images, one of teaching in the United States and the other of teaching in the countries with the world's most effective education systems. They are very different.

As we have seen, the prevailing view in the United States is that our teachers need not come from the more able strata of the college-educated population. We behave as if we believe that only a few weeks of training is needed to do what they have to do, a sure sign that we do not believe teaching is a profession at all. If they do get more, it can certainly be done in very low-status institutions, and if they do not have much training, it is no big deal. If there is a shortage of teachers, we quickly waive the very low standards we insist on in boom times. We congratulate ourselves on offering $10,000 signing bonuses to teachers when we worry about the qualifications of the ones we are getting, and then wonder why it does little to attract a better quality of candidate or simply more candidates. We do little or nothing about starting salaries that will not permit a young teacher to support a small family in the style to which college graduates are accustomed in this country. In most places, teaching continues to be a dead-end career, with no routes up except those that lead out of teaching. We make teachers the objects of research rather than the people who do research. We talk a lot about getting rid of the worst teachers, as if that was our biggest problem, but nothing about doing what is necessary to get better ones, thus accomplishing little but the destruction of teacher morale. We do all of this while talking a lot about teacher quality.

So it should surprise no one that we have a teacher quality problem.

When we looked at the countries topping the education league tables, we saw that teaching is not just referred to as a profession but is actually treated as though it is one. Those countries are willing to compensate teachers in the same way they compensate people in the professions, which, until recently, have been heavily dominated by men. They take their professional training seriously. It is lengthy and done in high prestige institutions. The standards for getting into those institutions are very high, and the competition to get into them on the part of top-notch students is quite stiff. The program of training mimics the way doctors and other highly regarded professionals are trained. They are carefully mentored by very capable people when they are hired. They are at the heart of the process of improving the system, not the object of that process, and their career prospects depend on their professional contribution, just as is the case for real professionals everywhere else. It would appear that the top-performing countries are far along in a process of converting their teachers from blue-collar workers to professionals

on a par with the other professions. Is it any wonder that these countries are experiencing much better results than the United States?

Of course, if teaching moves away from a Tayloristic work organization and takes on the attributes of a true profession, that will have implications for our teachers' unions and their contracts. American labor law is firmly grounded in the mass production model of work organization and assumes that workers and management will be locked in eternal conflict. The Taft-Hartley Act assumes that conflictual relationship and sets out the rules under which it will work. But, although that act of Congress was intended to apply only to the private sector, it was eventually applied to the public sector by most states, and that resulted in the work rules and contract provisions that are now giving this country so much trouble. Those rules can and should be changed. As the states decide to pay teachers like professionals and provide teachers the kind of professional responsibility and autonomy that other professions have, the teachers will need to be willing to write contracts that move away from the blue-collar model and toward contracts that embrace a professional model of work organization, in which teachers take responsibility for raising teaching standards to world-class levels, for the performance of students, for working as many hours as it takes to get the work done, for evaluating the work of their colleagues, recommending termination for teachers who do not measure up to high standards and so on.

Teachers will have to give up seniority rights of assignment and retention and other hallmarks of the blue-collar work environment and they will have to accept the proposition that some teachers will be paid more than others and have different responsibilities in recognition of their superior performance. That is part of what it means to be a professional. In exchange, of course, they will earn once again the high regard of the public and their peers, be paid like engineers and architects and doctors and enjoy the same high status in the community and their country that their colleagues in the top-performing countries enjoy.

•

Principal Quality

In much of the rest of the industrialized world, school leaders are called head teachers, because they continue to teach while they manage. Typically appointed because of their superior teaching ability, they are still viewed as teachers, but with additional responsibilities.

This is probably because schools in most other countries are smaller than American schools, but also because, in the United States, schools typically have less discretion, especially in the suburbs and cities, than in other countries, reporting to district central offices that are larger, often much larger, than their counterparts in most other countries. Having an intermediate layer of administration that is both larger and closer than it is elsewhere produces much more detailed and frequent requests and demands for information and compliance than school heads in most other countries experience. That, too, makes school leadership a full time job.

One result of this difference is that few of the countries with the most successful education systems have separate licensure for school heads or specialized training for them, though that is beginning to change, as many of the leading countries are now realizing that they may be able to improve their systems even further by attending more than they have in the past to the selection, training and licensure of school heads.

Singapore, an exception to the general rule, takes the training of school principals very seriously, offering, as we have just seen, a separate, defined career path for teachers who seek school and district leadership positions. Candidates for principal positions must take a six-month training program consisting of course work, supervised practice and mentorship, all monitored against clear definitions of the qualities that the Singapore government is looking for in their principals. The mentoring component of the program takes place during two sessions, each one a month long. Aspiring principals shadow principals hand-picked by the Ministry for their outstanding leadership qualities. The process is mediated by a faculty member from the National Institute of Education.

Instruction

The Japanese use an approach to instruction that can reasonably be described as whole class instruction or large group instruction but is definitely not lecturing. The teacher sets an assignment for the class, walks up and down the rows of students working the problem, picks out students using very different strategies for solving the problem, and asks the students who devised those strategies to come to the board— one by one—and describe their approach to the problem. The aim is not to focus on the right solution, but to provoke an extended class discussion of the various strategies used to get to a solution. This discussion of the strategies employed by the students is intended to help them understand *why* the right solution works, that is, to get to a deeper understanding of the topic under study than the American student typically gets by focusing only on the one method the teacher has decided to use to solve the problem. Because this technique depends for its success on identifying a good variety of solution strategies, teachers in Japan want large class sizes, not small ones. This approach to instruction is characteristic not only of Japan, but of many other East Asian countries as well.

Focusing on the relative effectiveness of different instructional strategies is obviously important in its own right, but it is also important because of the effects on other factors affecting student achievement.

Of all the strategies available to improve student performance, decreasing class size is among the most expensive and least effective. Instructional strategies that improve the outcome by increasing class size can release very large sums of money that can also improve student achievement, thus creating a very large multiplier effect. We will return to this point below in the discussion of tradeoffs in education system design.

But we should also note that the instructional methods used in Finland are different from those used in Japan, especially at the high school level. Though the Japanese are putting a relatively new emphasis on learning as distinguished from teaching, that is, on

promoting more student initiative in the learning process, Japanese teachers are still expected to stay pretty close to the national curriculum as promulgated by the Ministry, and that curriculum is pretty clearly spelled out. Finland, on the other hand, has been pressing hard in recent years toward a teaching and learning style in which the student takes increasing responsibility for the learning process. The Finns have been paring down the length of their curriculum guidance, and providing many more choices with respect to what is studied by modularizing the curriculum at the upper secondary level and letting the students assemble their own curriculum. This trend in curriculum is accompanied by a complementary trend in learning and instructional style, away from whole group instruction and toward problem- and project-based learning that is pursued individually and in teams. To the extent that students select and design their own projects and decide how to go about addressing them, this becomes student-directed learning in which the teacher becomes a facilitator rather than director of the learning process, and the object of instruction becomes not only the acquisition of subject-based knowledge and skill, but also the ability to frame problems to make them more amenable to solution, to identify possible sources of information that bear on the problem at hand, to analyze that information, synthesize what has been learned to frame a solution and then communicate the solution. What has just been defined is a disciplined learning process intended to enable the learner to come up with sophisticated and creative solutions to novel problems. Increasingly, this is the object of Finnish education. It requires teachers whose great skill is not so much the development of great lessons as teachers who are great stimulators, facilitators, mentors and partners in the learning process and who can create learning environments that are more like workshops than classrooms, whose intellectual skills and knowledge are deep enough and flexible enough for them to follow and lead their students in very unpredictable directions.

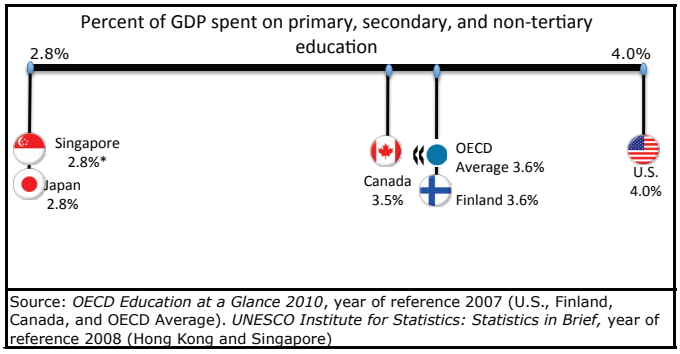
But we hasten to add that self-directed problem- and project-based learning can easily turn into a poor substitute for deep mastery of the underlying subjects in the curriculum. When the student lacks a firm command of the nuances of the core subjects in the curriculum, project- and problem-based curricula often result in very shallow knowledge gained in the classroom. What makes it work in Finland is the fact that these pedagogies and learning methods rest on top of solid mastery of the core subjects in the curriculum, acquired by Finnish students in the lower grades.

Design for Equity

School Finance

Local control of school finance has been an emblem of American education for a very long time, and is a deeply ingrained feature of our system. In essence, in many states, groups of citizens have been allowed to gather together to form their own education taxing districts. The result is that wealthy parents, by forming their own taxing districts, can drive their tax rates very low while benefitting from very high tax yields. At the other end of this spectrum, people who cannot afford very much for housing end up congregated together in districts where they must tax themselves at very high rates to produce a very low yield. In such a system, the children of the wealthiest families get the

best teachers and the best of all the other available education resources, and the families with the least money get the worst teachers and the worst of everything else as well.



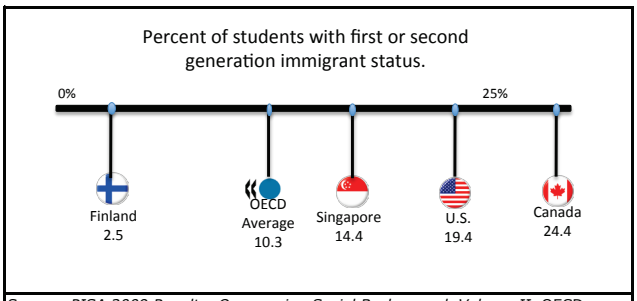
Source: *OECD Education at a Glance 2010*, year of reference 2007 (U.S., Finland, Canada, and OECD Average). *UNESCO Institute for Statistics: Statistics in Brief*, year of reference 2008 (Hong Kong and Singapore)

Almost all of the top-performing countries have been moving away from local control, if they ever embraced it, and toward systems designed to distribute resources in ways intended to enable all students to achieve high standards. That does not mean equal funding for all students; it means differential funding; it means unequal funding designed to come as close as possible to assuring high achievement across the board.

Perhaps the most interesting case from an American perspective is Canada. Two decades ago and more, elementary and secondary education in most of the provinces was funded much the way it is funded in the United States, with each locality raising much of the money locally, with the provinces providing additional sums intended to moderate the disparities in per student funding that such a system inevitably produces. But, about 20 years ago, this began to change. Conservative governments, in response to complaints from citizens about skyrocketing local tax rates, initiated a move to steadily reduce reliance on local taxes and to increase the portion of the total budget paid for by the province. In the biggest provinces now, little if any of the money for public education is raised locally. All or almost all comes from the province. Not surprisingly, the gross inequities that came with raising money locally are gone, too, and Canada, like the top-performing countries elsewhere, is moving toward a funding system intended to promote high achievement among all students, which means putting more money behind hard to educate children than children who are easier to educate.

Secondary School Organization

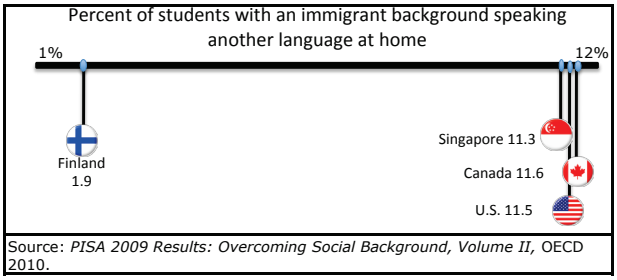
When one looks far enough back in the history of most industrial nations, one usually gets to a time when their primary schools were comprehensive (in the sense that students from all social classes were mixed together in all or almost all the classrooms) and the upper grades were not. As secondary education developed in most countries, separate schools were created for three groups of students: the children of the working class, the children of the artisans and shopkeepers and the children of the nobles, or, later, the professionals, owners and managers of the larger enterprises.



Source: *PISA 2009 Results: Overcoming Social Background, Volume II,* OECD 2010.

In some countries, secondary schools were comprehensive in their enrollment, but, as in the United States, there were different tracks or streams within those comprehensive schools for the children of different social classes, so the result for the students was the same as in those countries that had different schools for students from different social classes. Depending on the country, the break between the comprehensive lower schools and the tracked upper grades might come as early as the end of grade four.

In the Scandinavian countries, after World War II, the period of comprehensive basic education for all students was extended to the point that most of the Scandinavian countries now have common schools through grades nine or ten. Students from all backgrounds attend these schools and they get the same curriculum. In these and some other countries, it is not until a student is sixteen that education paths begin to diverge.



Source: *PISA 2009 Results: Overcoming Social Background, Volume II,* OECD 2010.

Inevitably, as the previously separate education programs are merged and the decision to give all students substantially the same education is made, there is a national discussion about the standard to which that education will be set. In the countries with the high-performing education systems, that argument was almost always settled by a decision that the standard to be adopted would be the standard that formerly applied only to the students in the top track.

This battle took place in Japan more than a century ago and in Finland after the Second World War. Singapore abandoned streaming in its primary schools, but the standard for its lowest stream just above primary school is still well above the average standard of performance for the OECD nations. The United States calls its high schools comprehensive schools, but it still offers different courses set to very different challenge levels to students from different social backgrounds in most communities. The implementation of the Common Core State Standards might change that, but, for now, few American high schools expect most of their students to reach a global standard of

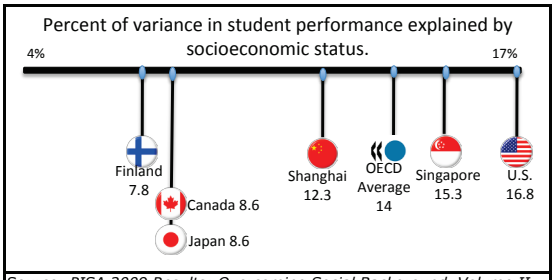
academic achievement by the end of grade nine or ten, though that is exactly what the top-performing countries are doing now.

Fixed Standards, Flexible Support

This point is directly connected to the last. In countries that expect their ninth or tenth graders to achieve at internationally benchmarked levels, we typically see that very few students are left behind and very few are pushed ahead by more than one grade a year. Virtually all but the special education students make a grade of progress for each year they are in school, against very demanding standards.

This requires very different supports for students than a system, like that of the United States, which is designed to operate by sorting students out along a long performance curve. In a system in which almost all students are expected to perform at high levels, the standard is fixed and the support varies to the extent needed to make sure that all students get to the finish line.

As we have already noted, this means that financial resources are allocated so that students who need more help are allocated more financial resources so they can get that help.



Source: *PISA 2009 Results: Overcoming Social Background, Volume II,* OECD 2010.

It also means that the students who are furthest behind get the best teachers, as is the case in Singapore. It is also the case in Singapore that the students who need help get more time, meaning time after school and on weekends and during the summer.

As we also saw above, in Finland and in many Asian nations, teachers are carefully trained to diagnose very quickly and accurately students who are beginning to fall behind and they are given the skills needed to figure out what those students need to get back on track quickly. In a sorting system, those skills are not very important, but in a system intended to get virtually all students up to a high standard and to keep them there, year after year, they are essential.

Low-Performing Schools

Sometimes it is not the student that is under-performing, but the school. This appears not to be a problem in Finland, where the variation in school performance is among the lowest in the world. As we have seen, Shanghai addresses this problem by requiring schools performing well to take responsibility for managing schools that are not

performing so well, by assigning high-performing staff members in high-performing schools to work in lower performing schools, by posting key staff members in low-performing schools to temporary assignments in high-performing schools to apprentice themselves to gain the skills they need, then sending them back to their home school and so on. Shanghai has also graded its schools by academic performance and the physical condition of its schools and shut down those in which both performance and physical condition did not justify continuation, sending the students and faculty to other schools as it built new schools to replace those in poor physical condition. Other Asian cities and nations have similar policies.

Design for Productivity

Management Paradigm

For many years, American policymakers have alternated between the search for quality and the quest for equity. What we are discovering is that other countries have figured out how to get both in greater measure than we. It would be natural for American educators to sigh and whisper that it would be wonderful to have both, but there is, apparently, no more money. Perhaps the most important discovery is that other countries have not only figured out how to get greater quality and far more equity, but they have figured out how to do that while spending substantially less than we do. They have not done it by doing a better job than we of managing the way we do. They have done it by adopting a very different way to organize the work of schooling.

The chief management guru of the early 20th century was Frederick Winslow Taylor. His counterpart for the latter half of the same century was Peter Drucker. Their messages were very different.

Taylor codified the methods of scientific management. Writing at the apogee of the mass production system, Taylor lived in a world in which goods and services formerly available only to the royalty and nobility were becoming increasingly available to Everyman, courtesy of very complex, very expensive machines that could turn out vast numbers of identical parts at remarkably low cost. Prior to the use of the mass production system, most finished products of any complexity were produced by craftsmen, one at a time, each object requiring great skill. But, in the mass production system, many fewer people—mainly the engineers who designed the machines and processes—needed high skills. Most other workers, from the people who minded the machines to those who assembled the parts into finished products to the clerks and the farm hands, required only basic literacy. Taylor declared that the way to run the system most efficiently was to observe many people doing these low level tasks, figure out who did them most efficiently and then make sure that everyone did it that way. Workers were just like the interchangeable parts they assembled. One was as good as another. Skill was not terribly important. Management just needed to make sure someone was doing the work and doing it efficiently.

The mass production method affected American industry more profoundly than that of any other major country. It was at its zenith when the current form of American

education was set in place. Though industry has long since moved on, the organization of work in American education has not.

Peter Drucker, in the 1970s opined that the age of mass production had reached its limit. The future, he said, belonged to firms and nations that embraced knowledge work and knowledge workers. By "knowledge work and knowledge workers," Drucker meant something very like "professional work and professional workers." Advanced industrial societies, Drucker said, would be able to maintain a high standard of living only if most of the workers were doing work that depended on them having a very high level of knowledge and the ability to apply that knowledge, case by case, to the challenges they faced every day. The challenges would be different, and so they would require a great deal of discretion as they figured out how best to respond to each challenge.

Taylor's methods would not work in such a situation. Workers would no longer be interchangeable. They would have to be managed in the same way professionals are managed and for the same reason. Rather than telling the workers just what to do and how to do it, managers would have to hire and train very high quality staff, set the goals, support the workers in every possible way and then get out of their way. The workers, who would themselves be the experts in the work, would have to figure out how best to meet the challenges they faced and would have to hold each other accountable for delivering top performance.

In the world of knowledge work, excellence would be rewarded. Blue-collar factory workers, Drucker said, expected an honest day's pay for an honest day's work. But knowledge workers, he said, expected an extraordinary day's pay for an extraordinary day's work like professionals in any field.

In varying degrees, all of the countries with high-performing education systems have been moving toward the management paradigm offered by Drucker. Few had embraced Taylor's system in its schools as avidly as the United States. But Taylor's paradigm is alive and well in American schools. It still influences our conception of teachers' work, the way we organize our schools, the way we talk about accountability, the way management in our schools relates to our unions, the way we respond to teacher shortages, the status of teachers colleges in our education system, and much, much more. Once the women and minorities who signed up for teaching when college-educated women and some minorities had a very narrow choice of careers retire, the United States is very unlikely to get the quality of teachers we need in the quantity we need them until we replace the Tayloristic paradigm of work organization with the model advocated by Drucker.

This is, of course, just what the top-performing education systems have been doing for years. The cases of Finland and Ontario are textbook examples of moves to forms of work organization in which teachers are treated much more like professionals and much less like blue-collar workers, cases in which management has been exercising progressively less control and providing progressively more support, and getting better and better results as a consequence.

Accountability and Autonomy

Accountability is one instance of the point just made. In Tayloristic management systems, the workers at each level are accountable to their supervisor. In many situations, as just pointed out, the worker is simply responsible for putting in an honest day's work for the requisite time on the clock. In others, the worker is paid by the number of units of product produced. In professional workplaces, however, while there is some element of accountability to one's supervisor, there is usually a major component of responsibility to one's professional colleagues for the quality and quantity of one's work. In professional workplaces, the workers are expected to put in whatever time it takes to get the work done. They feel a strong sense of responsibility to their colleagues to do their level best and they know that, at the end of the day, it is their colleagues, along with their supervisor, who will play a major role in determining their career prospects and very likely their compensation, both of which will depend on very nuanced judgments about their professional contribution to the work of the organization.

We can think of Tayloristic workplaces as emphasizing vertical accountability and professional workplaces as emphasizing lateral accountability. In Tayloristic workplaces, it is always very clear who the workers are and who management is. In professional workplaces, it is often the case that the professionals are organized as a partnership, and the workers are also the managers as well as the owners. Even when this is not the case, there is typically a strong element of lateral accountability in professional workplaces and it is usually also the case in professional workplaces that the workers are also managers, though they may not also be owners.

These differences in accountability between Tayloristic management systems and professional systems are a function of the nature of the work. If the work can be done by semi-skilled people who are essentially interchangeable and whose work is most efficiently managed by supervisors who are in a position to direct the work in detail by virtue of their superior knowledge, then a top down system of accountability will probably work best. But if the work is of the kind that Drucker was interested in, then the people in the best position to make the judgments about the way the service will be delivered will be the people actually doing the work, and they will have to have a wide range of discretion in determining how it will be done. The incentives that work in a Tayloristic workplace will not work in a professional workplace. Professionals, as Drucker pointed out, are much more motivated by the need to excel in the eyes of their professional colleagues and to meet professional norms. They will do whatever it takes, knowing that, if they don't, they could lose not only their job, but also the respect of colleagues whose respect they greatly value.

The other side of increased lateral accountability is increased professional autonomy. When there is one best way to get the work done, the job of management is to make sure it gets done that way, but when the best way to get the work done is a function of the particular unique situation one faces, then the professional must be free to make the decision as to how the service will be delivered to the client. One way to frame this is to

say that management has little choice in that situation but to trust the professional to know what to do and to do it.

But schools are small societies, not collectives in which each professional is an individual entrepreneur. Some teachers are better at one aspect of the overall work than another, just as some attorneys are better at bringing in new clients and others are better at research and writing and others are better at litigating. The law firm works best when these different skills and abilities are welded together in one team. So it is with a school. In such a situation, it is the senior members of the workforce who are in the best position to judge the contributions of each member of the team. Each has plenty of professional autonomy, but each is responsible to the other members of the team for the quality and timeliness of their work.

There is a general trend among the countries with the most successful education systems away from Tayloristic models and toward the kinds of accountability systems associated with professional work. The Japanese emphasis on earning the respect of the group of which one is a part puts great pressure on Japanese teachers to be accountable to the rest of the faculty for the effort they put into their work and the quality with which they do it. In recent years, the Ministry has, somewhat cautiously, begun to provide progressively less explicit direction to the schools and to provide greater degrees of freedom to school faculties with respect to how the Japanese curriculum will be implemented and on other matters. We can see similar trends in Singapore and China.

The Finnish reforms in the 1970s resulted in a much-admired and rather detailed specification of the Finnish curriculum. But, in the period since then, there has been a steady reduction in the detail with which the curriculum has been specified and the Ministry has abolished the Finnish inspectorate. All this has happened in a country in which there are no national examinations of all the students, so that neither schools nor teachers can be held accountable for their performance on the basis of data from such examinations. All of these policy positions are a measure of the high degree of trust that the Finns have in their teachers, but the high performance of Finnish students is a testament to the degree to which Finnish professionals hold each other accountable for the quality of their work and the effort they put into it.

The Canadian province of Ontario is another case, much like Finland, in which the current administration has abandoned the policies of its predecessor in favor of a policy of providing great discretion to teachers and trusting them to do the right thing, and getting great improvement in student performance in return.

Incentives

The way incentives are structured can make a big difference in the relative productivity of systems. Perhaps the best example is the effect on student motivation of the use of external examination systems as gateways by the best-performing nations. In countries with external examination systems used as gateways, as we noted, students have strong incentives to take tough courses and work hard in school. In the United States, unless a student is headed for a selective college, he or she quickly realizes that, even if the

objective is to get into an open-admissions college, it makes no difference whether the student gets good grades or a D minus, the result is the same: entrance to a non-selective college. The effect is to send a message to our students that high school is a place to hang out with one's friends. As long as you show up, you will do as well as you would if you take school seriously. What they do not know, of course, is that, if they have not done well enough to succeed in their initial credit-bearing college courses, they will have to take remedial courses for which they will receive no credit, while piling up debt. By the time they learn that, it is too late.

American policymakers assume that all school faculty have positive incentives to adopt research findings that show X works better than Y. But that is not true if they think that adopting X may arouse the anger of some vocal group in the community. Administrators are almost certain to get into deep trouble if they take high cost contracts away from local contractors in order to give them to lower cost national contractors, even though doing so would save a lot of money that could be used for instruction. Actually, faculty have stronger incentives to avoid trouble than they do to do what works for students. School people have no incentive to meet the needs of minority and low-income students if their performance improves and the money is taken away. If school administrators find a way to deliver the same services for less money, their reward is to have their budget reduced. Education school deans report that, if they propose to raise standards for admission in their schools, the arts and sciences faculty may veto that move because it might mean fewer students in their departments. Some minority students in inner city schools who decide to work hard in school are turned into pariahs for "acting White." Some teachers who do whatever it takes for their students are ostracized by their colleagues for violating the union contract. Teachers who teach complex skills to their students that are not measured on the standardized test they must give are sometimes penalized because they are not sticking to the schedule for teaching much lower basic skills. These are all examples of perverse incentives, that is, positive incentives for lowering, not raising, achievement. Our education system is rife with such perverse incentives.

High-performing education systems typically have far fewer perverse incentives than the American system. We have already pointed out that all students, not just those going to selective colleges, have strong incentives to take tough courses and study hard in the top-performing countries. Teachers in Japan have strong incentives to work hard and perform at high levels because of the value that all Japanese work groups place on that behavior. The Singaporeans provide substantial bonuses to teachers to do outstanding work. Teachers colleges in the best-performing countries are not expected to be "cash cows" for the arts and sciences schools in those countries. And so on.

If one does not like the performance of the education system, it is easy to blame the actors. But the chances are that you would behave just the way they are behaving if you were experiencing the same incentives. If you want better performance from the system, one of the first places to look for opportunities is the structure of incentives in that system. If you find a lot of perverse incentives—incentives to produce the behavior you do not want—then change the incentives. Our best competitors have done just that.

School-to-Work Transition

Investing more in education is sort of a bet, a bet that giving students a better education will result in certain outcomes. Among those outcomes is that they are more likely to be able to support themselves and their families and enjoy a good standard of living. But there is no direct connection between being well-educated and earning a good living. Students need to make an effective transition from school to work and that process is more complicated than it might at first appear.

Among other things, it involves turning academic skills into the kind of skills that are needed to do particular jobs, which always involves more learning, a part of which usually takes place on the job, under the supervision of an experienced hand. It involves an opportunity to get that experience, which usually requires access to an informal network of people who have jobs, internships or apprenticeships to offer. And it involves the acquisition of many skills and kinds of knowledge that are not included in the usual school syllabus.

Some countries have effective systems to effectuate such transitions and many do not. The United States is among the latter. Many graduates in the United States have few, if any, family connections to people who can and will offer them the first rung on the ladder, the chance to acquire the initial experience needed. Many lack the specific skills, attitudes and dispositions needed to succeed in those jobs. The result is very high youth unemployment rates, a high rate of youth delinquency and crime, and ruined lives.

Finland has multiple pathways that are highly developed and successful at delivering occupational skills at the upper secondary level, as does Singapore. Japan reaches much the same goal through its system of having designated high schools that supply high prestige employers with high quality candidates, who are then provided very high quality on-the-job training in the quality circles operated by those firms. These systems are very different from one another, but each is a vital component of that country's system for providing a rewarding future for all its children and a capable workforce to drive its economy. The point here is that a country may have a high quality pre-college education system and still have a low-quality workforce if it fails to create a sound school-to-work transition system.

Single Capable Center

Every high-performing country the National Center on Education and the Economy has studied has a unit of government that is clearly in charge of elementary and secondary education. In Canada, those units of government are not at the national level (the national government has even less responsibility for the schools than the federal government in the United States) but at the provincial level. In Finland, Singapore and Japan, it is the national Ministry of Education that is in charge. In China, Shanghai has unusual independence from the national Ministry of Education.

In many of these countries, educators view a position in the ministry as the capstone of a distinguished career. The ministry sees itself, and is seen by others, as having great

legitimacy as the keeper of the whole system, the agency responsible for defining the future course of education and for leading the national discussion as to the best shape for that system. It is often the case that these ministries do not have to issue many regulations because their informal guidance is so respected.

In such countries, the ministry has an obligation to concern itself with the design of the system as a whole, with the structure of incentives that design provides to everyone affected by it, with the coherence of that design and with the ability of that design to address the problems the country faces.

No unit of government in the United States occupies such a position. No one expects or wants the US Department of Education to play that role for the United States. Certainly, no city school district plays the role just described. But it is also true that no state department of education has a role comparable to that of a typical national ministry of education.

That is not because our state departments of education lack the constitutional authority to play that role. Most state departments of education are required by their state constitutions to provide a 'thorough and efficient education' to their citizenry. But two centuries of practice have vested a great deal of authority in local boards of education, to a degree that has no parallel in most other countries, and that authority was essentially delegated from the state a long time ago.

The result is that no level of government in the United States thinks of itself or is thought of by others as the place where the buck stops, the place where responsibility ultimately resides for the effectiveness and efficiency of the system as a whole. And the result of that is that education reform in the United States takes a different form than it typically does in the countries with the most effective education systems. When compared with other countries, the United States appears to see education reform as a process of adding programs to the corpus of programs already in place. We endlessly initiate new programs in the announced hope that they will somehow prevail, but the reality is that they gain favor with early adopters and rarely go much further. Where other countries carefully consider new policies and work hard to integrate them with existing ones in ways that will increase rather than decrease system coherence, the United States simply adds another program and hopes for the best. Which leads directly to the next point.

On Systems, Coherence, Alignment and Tradeoffs

It is at this point that the author will peep out from behind the screen of the anonymous voice and speak in the first person. After 22 years of research on the factors that account for the success of the countries with the best education record, I find myself convinced that seven things account for the lion's share of the difference: 1) aggressive international benchmarking, 2) the quality of the teaching force, 3) the use of aligned instructional systems and external examinations that measure complex thinking skills, 4) the decision to get all students to those standards, 5) the use of professional systems of work organization instead of blue-collar models, 6) funding systems that put the most funds behind the students who are hardest to educate, and 7) coherence of the design of the

overall education system itself, in all of its particulars. If I were forced to reduce the list even further, I would choose the second and last of these (though equitable funding is a close runner-up) .

Coherence of system design is that important. Why this is so is not immediately obvious. Our education research tradition has taught us to think in terms of the effectiveness of individual initiatives. We use statistical techniques to create a virtual environment in which we can simulate the effect of the intervention of interest on the outcomes of interest, everything else being equal. Then we wonder why the effects of even the most powerful interventions are almost always trivial.

The reality is that the outcomes we care about in education are the result of myriad variables, all jostling with each other in a great vat, interacting in ways we can not possibly visualize or simulate in our computers, to produce the outcomes we see. Each program we evaluate with our sophisticated research techniques can actually be considered in real schools and school systems as one among many variables affecting the outcomes we care about. If no one thinks of themselves as responsible for the design of the overall system of which those variables are a part, then we should not be surprised that any single initiative or program, no matter how well conceived and executed, has a relatively small effect on student achievement. Because so many things affect the outcome, in ways that no policymaker has thought very much about, it is to be expected that altering one variable cannot affect the outcome very much at all, one way or the other. The one thing that could have a very large effect—the design of the system itself—is no one's responsibility.

Visiting the average school is a bit like an archeological exercise, consisting of unearthing layer upon layer of initiatives carefully deposited in the school over the decades of its existence: a text that the social studies text selection committee liked ten years ago when it was all the rage, an instructional method that Jack and Judy brought back from their professional development program during the last administration, that technique that the central office was onto six years ago and caught the fancy of our then-principal, who of course moved on last year and was replaced by a principal with a very different agenda. But none of it ever really goes away. Legislators add law after law, the courts make their decisions, the state department issues regulation after regulation—all of it is added on until it looks like the folded sedimentary rock in the road cut on the interstate going out of town.

It is little wonder that our systems are full of negative and perverse incentives. No one ever thought about how all of these layers of law, regulation, court decisions, textbook choices, professional development programs and much, much more fit together and so it is little wonder that they do not. As we pointed out above, the texts do not align to the curriculum, which are not aligned to the assessments, which are not aligned to what teachers are taught in teachers colleges, which is unrelated to the curriculum frameworks, which do not exist.

Americans can only imagine what might happen if we had an education system in which the parts and pieces of the system were constructed to fit together in a sensible way, so that they reinforced each other rather than spent their lives fighting with each other. This is the end result of living in a country that was founded by people who deeply distrusted government and believed that education was one arena in which local decisions would be best, because local people knew best what their children would need to be successful.

The reality is that local control is mostly honored in the breach. Textbook manufacturers control the curriculum actually taught, to the extent that anyone does. Districts must choose among national tests made by national testing companies. The curricula of schools of education are more influenced by the curricula of other schools of education around the country than by the state in which they are chartered. Local control is a chimera. But no one else is in control either.

Our forefathers and foremothers never imagined a world in which the sons and daughters of local citizens would be competing for jobs directly with the sons and daughters of people who lived on different continents in a very complex global economy that would require highly complex education systems designed and overseen by people with rare expertise. But that is the situation we now face and our educational institutions are not well equipped to cope with it.

To talk with the people who run the Singapore education system is to hear a tale in which the designers worked as an engineer would work to build an ever more effective system, step by step. That is actually just what they did, rising from third world status fifty years ago to front rank status today. Wave on wave of visitors have descended on Finland to find out what key policy initiative vaulted them to world class status while no one was looking. But the visitors find out that there was no single policy initiative the Finns took to get where they are. Like the Singaporeans, the Finns, it seems, worked in a logical way, while governments came and went, in small increments over the same fifty years to take an education system designed to support a small rural economy to world leadership in just five decades. At each stage, these countries had education systems that were genuine systems.

It is only when one considers the education system as one coherent whole that it becomes possible to analyze and deal with the tradeoffs that are inherent in any system.

Consider Japan, for example, where, as we have seen, the overall ratio of students to teachers is much the same as in the United States, but the classes are considerably larger, leaving much more time for teachers to plan and develop more effective lessons and to work with individual students and small groups of students.

Consider Finland, where the government has provided its teachers with greater autonomy with respect to the curriculum and accountability as the quality of its teachers have improved. Reducing the detail with which the curriculum is specified, virtually eliminating test-based accountability and closing down the inspectorate, which is what the Finns have done, would make no sense at all if the Finns had doubted the quality of

their teachers, but all became necessary when they had managed to produce one of the highest quality teaching staffs in the world. It is essential for a high-performing country to trust its teachers, but it had better have teachers it can trust.

The most important tradeoffs undoubtedly lie in the area of system effects having to do with investments in quality.

The American mass production system was primarily concerned with driving cost down as low as possible. Quality was secondary. American production lines would produce a lot of parts and finished products that needed to be thrown out or remanufactured. But, in the latter half of the 20th century, the Japanese, borrowing American ideas that did not get a hearing in the United States, started to reengineer their manufacturing systems to assure that quality was built in at every stage of the process, with the result that the finished product met very high quality criteria with very little wastage produced along the way. They actually showed that it is less expensive to build quality in at the beginning than to compensate for the lack of quality at the end of the production line.

Part of the price paid by the American education system for being built on the mass production model is that we tolerate an exceptionally high rate of wastage. Only in our case, what is being discarded is young people. We see this in the very high percentages of young people who are not fluent readers by the time they leave elementary school, the very high rates at which students drop out of high school, the appalling rates at which those who enroll in college need remedial work when they get there and the equally appalling rate at which they drop out and never receive a degree.

That does not happen in the countries with the best-performing education systems. These countries have learned how to build quality in beginning before birth and extending throughout the entire education process. One illuminating example will suffice. The United States, as we explained above, is now bottom fishing for its teachers, sending them to low status training institutions, preparing them poorly for teaching, not supporting them in their initial years while they are learning the ropes and compensating them poorly. It should not surprise us that a significant number of teachers do not do a good job, nor should it surprise us that many want out. Close to a third of those who trained as teachers are gone within three years and close to half are gone in less then five years. These rates are significantly higher than for other occupations.

Imagine what would happen if they stayed for ten years, on average, instead of three to five years. We would need fewer than half as many slots in our teachers colleges. We could afford to upgrade their training substantially and still have money left over, which we could use to provide them with better support when they get their first job and there might even be money left over to raise their pay. We might be able to get a world class teaching force for the same money we are paying now, in the same way that our automobile companies found out that they could produce much higher quality cars for the same money it cost to produce low quality cars.

Consider another take on the same theme. As noted above, most of the top-performing countries are getting their students through the common curriculum by the end of the lower secondary school, or about the age of 16. We shoot for the doing the same thing by the end of upper secondary education. Suppose we set our system up to match their achievement. We could save the cost of the junior and senior year of high school. Of course, we would not really save it, because we would need the extra money to make the improvements needed to get all our students to the goal line by the time they are 16. But the reality is that 30 percent of our students drop out, and a substantial fraction of the rest leave high school with no more than an eighth or ninth grade level of literacy. Our competitors have dropout rates in the neighborhood of 10 percent or less and they leave with average literacy rates far higher than ours. So we could get much better results than we are getting now for the same money by taking the money we are wasting on the last two years of high school and spending it wisely in the earlier years, as our competitors do.

The reason I believe that high quality staff, equitable funding and coherent systems are the key to highly successful education systems is that these points lead to all the others. Any country that recruits its teachers from the higher ranges of the applied ability distribution will quickly find that—in order to keep them—it has to train them in high quality, high status universities, support them well once hired and offer them decent pay and professional work environments, and—not least—trust them to do the right thing. Any country that really strives for coherence and which seriously researches the best practices of the leading countries will in time be forced to adopt high quality curriculum-based examinations and use them to define a few important gateways, to develop strong curriculum frameworks, and to fund their schools equitably and make sensible trade-offs as they make decisions about how their money will be spent. Any country that moves toward a system of truly equitable school finance has made the crucial decision to get all of its students to high standards. These key practices, if informed by serious international benchmarking will, in time, lead to all the others.

The Dog That Did Not Bark

In one of Arthur Conan Doyle's best-known Sherlock Holmes stories the clue is a dog that did not bark. In this case, the dog that did not bark is the dominant element of the American education reform agenda. It turns out that neither the researchers whose work is reported on in this paper nor the analysts of the OECD PISA data have found any evidence that any country that leads the world's education performance league tables has gotten there by implementing any of the major agenda items that dominate the education reform agenda in the United States.

We include in this list the use of market mechanisms such as charter schools and vouchers, the identification and support of education entrepreneurs to disrupt the system, and the use of student performance data on standardized tests to identify teachers and principals who are then rewarded on that basis for the value they add to a student's education or who are punished because they fail to do so.

This is not to say that none of these initiatives will lead to significantly improved performance at scale. It is only to say that none of the countries that have the best records of performance have employed these strategies to get there.

It is important here to make it clear that many countries are interested in current efforts in the United States to identify through research what makes for good teaching and for a good teacher. They understand that such information, if we can get it, would be very useful in creating criteria for admission to high quality teacher education programs, for designing those programs, for producing better criteria for licensure, for creating better professional development programs and for evaluating teachers. But they worry that using standardized test data as a major basis of evaluating and rewarding teachers will create perverse incentives of many kinds and they also worry both that there is much in student performance that is important that standardized tests are unlikely to capture and that great student performance is the result of the work of many adults working in collaboration rather than individual teachers working alone.

An Agenda for American Education

What follows is a new agenda for recasting the structure of the preceding section, derived from the experience of the countries that have consistently outperformed the United States. It was constructed simply by taking the subsection headings and reframing the language of the preceding sections in the form of an action agenda. To be clear, this is not an agenda for the United States; it is an agenda for individual states:

- **Benchmark the Education Systems of the Top-Performing Countries**
  - Make sure you know what the leaders are trying to achieve, the extent to which they achieve it and how they do on common measures
  - Compare your state to the best performers, with particular attention to countries that share your goals
  - Conduct careful research on the policies and practices of the best-performing nations to understand how they get the results they get
  - Benchmark often, because the best never stand still

- **Design for Quality**
  - Get your goals clear, and get public and professional consensus on them
  - Create world-class instructional systems and gateways
    - Define a limited number of gateways — not more than the end of basic education, end of lower secondary and end of upper secondary (matched up to college entrance and work-ready requirements)
    - Create standards for each gateway, making sure they are properly nested and are world class

    - Create logically ordered curriculum frameworks (topics for each year for each subject) for the basic education sequence
    - Create curriculum (broad guidelines, not lesson plans) for each school level leading up to the gateway exams (the level of detail at which this is done should be inversely related to the quality of your teachers)
    - Create exams for each gateway, based on standards and curricula
    - Train teachers to teach those curricula well to students from many different backgrounds
- Develop a world-class teaching force
    - Raise standards for entry into teacher education to internationally benchmarked levels, including standards for general intelligence, level of mastery of subject matter content and ability to relate to young people, with rigorous selection processes
    - Move teacher education out of second and third tier institutions and into the major research universities
    - Insist that teachers of all subjects at all levels have a depth and breadth of mastery of the subjects they will teach comparable at the bachelors degree level to that of the people who will go on to graduate education in those fields
    - Make sure that prospective teachers have excellent skills in diagnosing student problems and prescribing appropriate solutions
    - Design the teacher preparation program on a clinical model, with plenty of clinical experience under the constant supervision of master teachers in real settings
    - Raise the criteria for teacher licensure to internationally benchmarked levels and never, under any circumstances, waive the licensure standards in the face of a teacher shortage
    - Make sure compensation for beginning teachers is and remains comparable to compensation for the other non-feminized professions; add the amounts necessary to attract capable teachers to hardship locations, and specialties in shortage; tie amounts to steps on the career ladders (see below)
    - Provide for an induction period for new teachers of at least a year in which they are supervised by master teachers who are released from full time teaching for this purpose
    - Construct multiple career pathways for teachers one of which is into school administration, at least one of which is in teaching and all of which provide for merit-based advancement with increasing responsibility and compensation

- Set up a system for identifying teachers who have been in service for a few years who have the attributes likely to enable them to be strong candidates for one of the career pathways; groom them for advancement by offering them free advanced training tied to the steps on the career ladder; provide mentoring and other forms of support and continue that support as long as they continue to be promising candidates for advancement.
- Explore the development of approaches to instruction that would enable the state to get world-class results with larger class sizes. Class size is important because it is the fundamental driver of teacher cost and teacher cost is the fundamental driver of the cost of the entire system. Japan has shown how it is possible to increase class size and increase student performance at the same time. Perhaps that method would work in the United States, perhaps not. It is important to find out and, if it does not work or work as well, to make as much progress on this front as possible.

- **Design for Equity**
  - Move toward full state adoption of responsibility for school finance and toward implementation of a weighted pupil finance system, which would calculate the amount due each school entirely on the basis of a uniform state formula. Let parents and students choose among public schools, with the funding following the student. The formula would provide funding to any public school chosen by the parents and the student, with the same base funding behind all students in the state, but additional amounts going to students based on the cost of bringing that student up to the high state academic standards. Among the students bringing more money to the school would be those from low-income families, students from families that do not speak English at home and those with some form of disability.
  - Develop a system in which all schools, from kindergarten through the end of lower secondary school, are truly comprehensive, open to all children of all races, ethnicity, gender and socio-economic status and are untracked, and committed to bringing all students up to the same high standards, irrespective of background
  - Make sure that schools have the same high expectations for all students and that they provide the additional supports required by students who need them to achieve those standards (which is why a weighted student formula for school funding is necessary)
  - Identify schools that are not succeeding in bringing all their students to high standards and close those schools and distribute the students to high-performing schools, send key staff from better-performing schools to take leadership positions in the low-performing schools, and send key staff from low-performing schools for training in the high-performing schools or have the managements of high-performing schools also take responsibility for managing the low-performing schools.

- **Design for Productivity**
  - Adopt as a conceptual framework for the reform program the goal of reframing teaching from a feminized occupation performed in a Taylorized work organization to professional work (or knowledge work, as Peter Drucker would have it) performed in a form of work organization appropriate for professionals
  - Look for opportunities to build quality into the education system from the beginning rather than cope with the high rate of wastage in the current system
  - Examine the total state budget for opportunities to make better tradeoffs between major budget elements in favor of higher productivity
  - Do what is necessary to redesign the state department of education so that it has the capacity and status needed to drive the state education system to excellence
  - Examine the state's school-to-work transition system to see if it is truly world class in the way that it enables all young people who want it to get access to high quality work experience and on-the-job training, access to networks of people who are offering good jobs and access to further schooling designed to provide high quality education and training leading to industry-recognized occupational certification.

- **Make sure your systems are coherent and aligned**

But that's impossible! Realistically, how can we get started?

Sure, you say. All this sounds sensible and you have explained that it is all being done somewhere by somebody, but it simply cannot be done here, in these United States, or at least in my state, in the foreseeable future. Too many vested interests, too deep a commitment to local control, too many teachers colleges to be shut down, too many objections from unions, too few master teachers available, just too much!

It has taken from 30 to 100 years to build the national and provincial education systems on which these recommendations are based. None were built in one or two decades. If the United States is to catch up, it will have to get started soon and will have to work very hard at it for a long time. But what to do while waiting for the long-term payoff?

We have not mentioned Canada much until now, because this is where it fits. The government of Ontario did not predicate their reform program on replacing its current teacher workforce with a new workforce. They did not think they needed to. They asked themselves how they could get much better results from the workforce already in place. The answer they came up with was to make peace with the teachers unions that had been demonized by the previous administration and with the teachers that had been so badly

demoralized and they invited them to join them in thinking through a reform program that would improve student performance. They insisted on high standards but they listened hard to what the teachers had to say about the support they needed to raise student achievement to those standards. They decided that the highest leverage strategy available to them was to build the capacity and professional skill and commitment of their in-place teaching force. They focused on what it would take to build capacity at every level of the system to deliver, and wherever possible, supplied it. They made a point of trusting teachers and the teachers returned their trust.

Earlier, as we have also related, they redesigned their school finance system to create one far more equitable than the one they had had. It is impossible to overstate the importance of this policy change. On that foundation, they built an education system, province by province, that put the nation as a whole comfortably among the top ten performers in the world.

The measures just described did not result in equal improvements at all student ability levels. There was broad and substantial improvement for the students in the bottom half of the achievement distribution, but much less among those who had been doing better before these measures were introduced. There was considerable improvement on measures of basic skills, but nowhere near as much on measures of higher order skills. Which is exactly what one would expect of such an approach. It is not surprising that, with the same teachers in place who had been in place before these initiatives, and with a strong effort to build capacity in the teaching force where the teaching force felt it was most in need of additional capacity, one would see the most improvement among the students who had been doing least well.

One way of looking at what the Ontario government did was that, by building the capacity of the current teaching force, they took the distribution of student performance and moved the left tail of the performance curve toward the middle of the curve, while the middle and right hand parts of the curve did not change much. One can think of their next challenge as moving the entire curve to the right, so that the performance of all students improves substantially, and the performance of the students who perform least well is not far from the best-performing students, who would then be performing at world class levels. That is precisely how we defined world class performance at the beginning of this paper. To get that, we would argue, Canada would have to adopt the other features of the agenda of their top- performing peers.

And that is exactly what we think makes sense in the United States. Start with the Canadian agenda, while also, at the same time, begin to work on those parts of the larger agenda that seem possible at the outset. The strategies chosen would be different for different states, depending on what is politically possible, what the state's strong points are and the nature of its weak points. But working over time in this way strikes us as plausible in the real world.

Bear in mind, we are not suggesting that it is possible to short cut the steps the top performers have taken on the way to the top of the league tables. Canada, like many of

the other top performers, has moved the preparation of its teachers into the universities. In order to teach in Ontario schools, high school graduates must complete a degree program in the subject they wish to teach and another degree program lasting at least a year in professional education. This includes elementary school teachers, who must specialize in one or two subjects in the elementary curriculum, such as English, history, science or mathematics. Secondary school teachers must have academic credentials in at least two subjects, such as English and history, or music and mathematics. Candidates who think they might want to be a subject specialist must take an honors degree. High school students must have 3.2 to 3.3 grade point averages on a scale of four to get into the institutions offering the first of these two degrees. There are fewer universities per capita than in the United States and the universities in which teachers are trained have a higher status than their opposite numbers in the United States. Teachers in Canada are better paid than American teachers.

It might be fair to say, then, that the Canadian benchmark before embarking on the current round of reforms was above where the United States is now, but within reach. An American state could reasonably set an agenda for reaching toward the Canadian starting line, then their current state and then the more distant configuration of public policy for education that has been adopted by the very best performers in the world. That is a very ambitious agenda, but it is doable, by stages.

What the Federal Government Can Do

No one wants a national education system in the United States. Even if one wanted to mandate that a state adopt an agenda of the sort described above, it would not work. The kinds of systems we described would not be faithfully implemented in a state that was opposed to them, no matter what compliance mechanisms were used. Nor is it very likely that all states would want to embark on such an agenda. That logic suggests a federal government interested in the adoption of such an agenda would be well advised to provide assistance to states that would really like to implement such an agenda, but which, in the current environment, lack the resources needed to do so.

The agenda we have laid out here is consistent at many points with the markers that the Congress and the Obama Administration have already put down. This paper began by noting that Secretary Duncan has reversed half a century of history by actively calling the attention of this country to the achievements of the countries that are outpacing us in education and doing something to learn how they do it. The Race to the Top program was designed and passed in a form that encourages the kind of comprehensive and coherent planning advocated here, rather than the digging of postholes encouraged by categorical programs. Through the Common Core State Standards work, a major step toward the implementation of the kind of internationally benchmarked standards embraced by all high-performing countries was initiated by the states, and has received the enthusiastic support of the Administration. And the Administration initiative to use Race to the Top funds to support the development of tests matched to the standards should move the United States much closer to the kinds of powerful, cohesive instructional systems the top-performing countries have. The President's call for making

all high school students college and career ready and for setting a goal of once again leading the world in college completion is a big step toward developing the kind of consensus on education goals that characterizes the countries with the best education performance. And the Administration has proposed a number of initiatives on teacher quality in the United States that are consistent with the strategies other countries have taken to assure themselves a strong supply of high quality teachers in the years to come.

So the stage is set. The time has come to build on these beginnings and to embrace aggressively a comprehensive agenda that is squarely based on the principles that lie behind the success of those countries that have been leading the world's education league tables.

This paper is being written on the eve of reauthorization hearings for the Elementary and Secondary Education Act. We suggest that a title of that act be written that would create a competition among states for funds that would be used to implement the agenda described in this chapter. We would make sure that there was considerable latitude for the states in the way they approached their design for implementation. It might be appropriate for the federal government to conduct activities intended to broadly familiarize the states with the strategies being employed by the countries with the most successful education systems before the competition takes place. People familiar in detail with those strategies, including representatives of the countries at the top of the league tables, people who have researched those countries, as well as people familiar with each states' current situation, might be involved as reviewers of the state proposals. After the first round of such grants is made, the government might wish to sponsor additional rounds.

We would be leery of mandating specific design features in the announcement of such a program, much less implementation schedules and deadlines. States should be free to build on their existing strengths and to minimize their weaknesses as they build their strategies. Their strategies need to reflect their politics and their history. The review process ought to be less a compliance check than an assessment of their determination and their capacity to take full advantage of the path blazed by the countries with the most successful education systems. Let the states convince the readers that they understand what has happened in these countries and are prepared to do what is necessary to adapt and profit from that experience in their own unique ways.

What the States Can Do

But the real action would be, of course, in the states. Whether or not the federal government chooses to take an active role, the states have all the authority they need to move in the direction outlined here. This is, needless to say, a very ambitious agenda. It is inconceivable that it could be successfully implemented without capable and determined leadership to produce a wide consensus for the main outline of the work. In almost every case described in this paper, there was an individual or a political party that provided unusual continuity of leadership for this agenda over a long period of time. That is not easy to achieve in the United States, but not impossible, either.

The claim that this agenda has on our attention is simply that it has worked. It has worked in countries as different as Singapore and Finland, Japan and Canada. It is not a Republican agenda or a Democratic agenda. It is neither conservative nor liberal. While it requires major changes in the way we do things in the United States, it demands changes more or less equally of all parties. The changes it calls for are as dramatic as the changes made in government in the Progressive Era, but let the record show that the United States made those changes. It can make these, too, if it chooses to do so.

Bibliography

Allegretto, S. and Mishel, L., *The Teaching Penalty: Teacher Pay Losing Ground*, Economic Policy Institute, Washington, DC, 2008.

Asia Society, *Canada: School Improvement without Rancor and Rankings*, New York, NY, 2010.

Auguste, B., et al., *Closing the talent gap: Attracting and retaining top-third graduates to careers in teaching*, McKinsey & Company, September 2010.

Costrell, R., and Podgersky, M., *Teacher Retirement Benefits*, EducationNext, Cambridge, MA, volume 9, number 2, Spring 2009.

Education Trust, *CORE PROBLEMS: Out-of-Field Teaching Persists in Academic Courses and High-Poverty Schools*, Washington, DC, November 2008.

Economic Policy Institute, *How Do Teachers Wages Compare? Methodological Challenges and Answers*, Washington, DC, 2004.

Franke, R., et al., *Findings from the 2009 Administration of the College Senior Survey: National Aggregates*, Higher Education Research Institute Graduate School of Education & Information Studies University of California, Los Angeles, CA, February 2010.

Gitomer, D., *Teacher Quality in a Changing Policy Landscape: Improvements in the Teacher Pool*, Educational Testing Service, Princeton, NJ, 2007.

Heilig, J. and Jez, S.J., *Teach for America: A Review of the Evidence*, The Great Lakes Center for Education Research and Practice, East Lansing, Michigan, 2010.

Higher Education Research Institute, *Findings from the 2009 Administration of the College Senior Survey (CSS): National Aggregates*, Graduate School of Education and Information Studies, UCLA, Los Angeles, CA, February, 2010.

Hurley, E., *Teacher Pay 1940—2000: Losing Ground, Losing Status*, National Education Association, Washington, DC, 2006.

Lykins, C. and Heyneman, S., *The Federal Role in Education: Lessons from Australia, Germany, and Canada*, Center on Education Policy, Washington, DC, November 2008.

Markow, D. and Cooper, M., *The MetLife Survey of the American Teacher: Past, Present and Future*, MetLife, Inc., New York, NY, October 2008.

MEXT: Japan Ministry of Education, Culture, Sports, Science and Technology, *Education Reform for the 21st Century, National Council of Education Reform and the Process of its Reform*, Tokyo, Japan, 2010.

Ministry of Education, *Guidelines for Curriculum Reform in Basic Education*, Beijing, China, 2001.

Ministry of Education, *Towards Thinking Schools*, Singapore, 1997.

Ministry of Trade and Industry, *The Singapore Economy: New Directions*, Singapore, 1986.

National Association of Colleges and Employers, *Salary Survey*, Bethlehem, PA, 2010.

National Center for Education Statistics, *Characteristics of Schools, Districts, Teachers, Principals, and School Libraries in the United States: 2003-04 Schools and Staffing Survery*, Washington, DC.

National Science Foundation, *Science and Engineering Indicators: 2010*, NSB 10-01, Arlington, VA, 2010.

Norrie, K. and Lin, S., *Postsecondary Education Attainment and Participation in Ontario*, Higher Education Quality Council of Ontario, Toronto, Ontario, November 2009.

Ontario College of Teachers, *Thinking About Teaching*, Toronto, Ontario, 2011.

Ontario Focused Intervention Partnership 2007-2008, PowerPoint Presentation, The Literacy and Numeracy Secretariat, Ontario Ministry of Education, Ontario, Canada, downloaded March 2007.

Orland, M., *School Turnaround Policies and Practices in Australia, Canada, England, and New Zealand: Overview and Implications*, San Francisco, CA, WestEd, March 2011.

Sclafani, S. and Lim, E., *Rethinking Human Capital in Education: Singapore As A Model for Teacher Development*, The Aspen Institute, Washington, DC, 2008.

The College Board, *2008 College-Bound Seniors, Total Group Profile Report*, New York, NY, 2008.