

5. Establishing the Foundation for Economic Growth

THE ALABAMA EDUCATION LABORATORY

ERIC A. HANUSHEK

EXECUTIVE SUMMARY

The long-run development of the Alabama economy depends on the quality of its labor force. While it may be possible to attract new, highly skilled workers to Alabama with a variety of incentives and inducements, development of its citizens through the Alabama schools will remain the central source of talent.

Performance of Alabama students is currently not comparable to that of students in other US states or other countries that are in direct economic competition. Improving the K–12 schools in Alabama must be a central component of any economic development strategy. Such improvement is not a onetime event that relies on any simple and quick solutions. Instead, it must be viewed as a central policy activity that continues over an extended period of time—decades, not years. Success depends crucially on establishing a program of continuous improvement and then staying with it.

The state currently lacks any institutional capacity to evaluate new and ongoing education programs and policies so that success can be expanded and failure can be curtailed. One way to remedy this is to develop the Alabama Education Laboratory. This would be an independent institution that conducts systematic research on and evaluation of Alabama schools.

This is an opportune time to develop such a laboratory. One reason is the recognition of the need for development by the Alabama Innovation Commission. There is also the COVID-19-induced critical need for improving the schools, if only to maintain the current status. And there is funding available from the federal American Rescue Plan.

Introduction

The long-run development of Alabama is closely tied to the skills of its population. And the skills of the population depend crucially on Alabama schools. Alabama students currently fall significantly behind students in other states. This learning gap is not solely attributable to the schools, but the schools are the primary force that can be employed to improve the outcomes.



Improving the quality and impact of the schools is not something that can be done quickly, because there is no simple blueprint for how to get the gains in learning that are needed. Improvement is something that has a large local element, depending on both local demands and local capacities. It is nonetheless something that can be required, aided, and facilitated by the state.

The state currently lacks any place where systematic evaluation and assessment of successful (and unsuccessful) school programs takes place. It is possible to borrow from the experiences of other states and localities, but this is often difficult to do successfully without local modification and adaptation. This raises the need for a concerted effort to have ongoing evaluations of school programs.

Now is a particularly opportune time to address these issues, and it should not be allowed to pass. The federal government has provided substantial additional funding, designed as a way to deal with the COVID pandemic and a way to improve the schools in order to overcome the accumulated learning losses. By directing a portion of these funds toward a new state evaluation function, Alabama can position its schools for long-run improvements.

This chapter begins with an overview of the challenges facing Alabama schools. In that context, it provides an analysis of what feasible improvements in the schools could mean for the economic well-being of individuals and for the state. From these it sketches a way to structure an education laboratory that can begin to provide guidance to the improvement of schools.

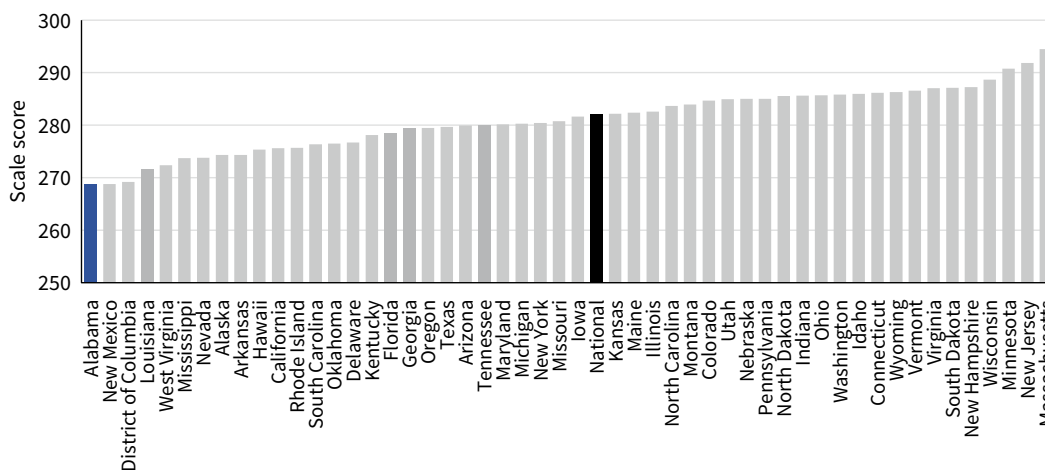
Current Challenge to Alabama

Low educational outcomes in Alabama represent the largest long-run challenge to the state. Improvements in the schools would provide continuing economic improvement. Or, put the opposite way, it will be difficult for the state to sustain long-run economic growth without a significant improvement of its schools.

The clearest picture of the challenge to Alabama comes from the National Assessment of Educational Progress (NAEP).¹ This regular testing—often referred to as “the nation’s report card”—provides an indication of the level of performance of Alabama students at different grades and in different subjects.

NAEP is not geared to the individual learning standards of each state but instead is designed to assess generic skills of students that are appropriate for different grades. Importantly, performance on these tests is correlated with the future economic success of students, of each state as a whole, and of the nation.

Figure 1. NAEP mathematics, 8th grade, 2019



Note: DoDEA= Department of Defense Education Activity. Some apparent differences between estimates may not be statistically significant.

Source: US Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2019 Mathematics Assessment.

If the most recent scores in mathematics by eighth graders are compared, Alabama students come in behind all other states and the District of Columbia (see figure 1). The average scores are, however, sometimes difficult to interpret. The average eighth grader in Alabama in 2019 fell at the thirty-seventh percentile of national distribution. In other words, 63 percent of all eighth graders in the United States scored better in mathematics than the average Alabama eighth grader. In a comparison with the top performing state, the average Alabama eighth grader placed at the twenty-sixth percentile of the Massachusetts performance distribution.

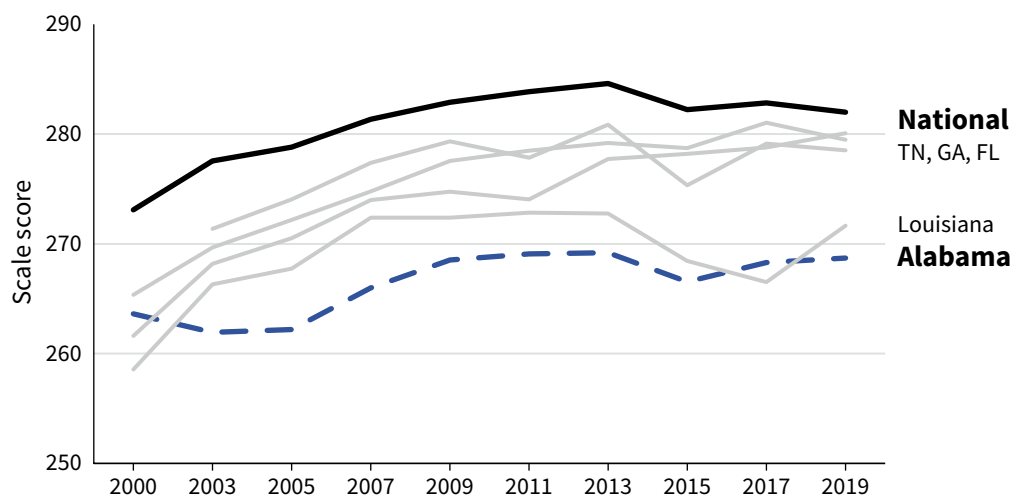
While Alabama students have performed better over time, the improvement has not been as large as those of students in some nearby states or in the nation as a whole. Figure 2 shows the performance patterns in Florida, Georgia, and Tennessee, which have each pulled away from Alabama over the past two decades, while Louisiana has hovered closer to Alabama.

Another important way to look at the data on student performance is to understand how many students fail to reach even the basic skill level on NAEP. The basic level can be understood as being minimally competitive in the modern, information-based economy. NAEP describes this level for eighth-grade mathematics as:

Eighth graders performing at the NAEP Basic level should complete problems correctly with the help of structural prompts such as diagrams, charts, and graphs. They should be able to solve problems in all NAEP content areas through the appropriate selection and



Figure 2. NAEP mathematics, 8th grade, 2000–19



Note: Some apparent differences between estimates may not be statistically significant.

Source: US Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017, and 2019 Mathematics Assessments.

use of strategies and technological tools—including calculators, computers, and geometric shapes. Students at this level also should be able to use fundamental algebraic and informal geometric concepts in problem solving. As they approach the NAEP Proficient level, students at the NAEP Basic level should be able to determine which of the available data are necessary and sufficient for correct solutions and use them in problem solving. However, these eighth graders show limited skill in communicating mathematically.²

Table 1 indicates that 43 percent of Alabama eighth graders cannot reach this minimal level of math competence (compared with 30 percent nationally). The picture is particularly disturbing for Black students—65 percent in Alabama perform below the basic level.

In today's world, however, the comparison is not just with Georgia and Louisiana. Instead there is global competition as international trade and production have opened the world for skilled labor. In a study comparing Alabama students in 2009 with those in the rest of the world, it could be seen that Alabama students were competing with those in Turkey, Serbia, and Bulgaria.³ This situation does not bode well for the future.

Performance on NAEP and other standardized tests is a harbinger of future economic well-being. It turns out that the skills measured by these tests are closely related to future incomes of students. In fact, the United States rewards these skills more than virtually all countries of the world.⁴ But that also implies that the US labor market punishes the lack of skills more than virtually all countries of the world.

Table 1. NAEP mathematics, 8th grade, 2019

	<i>National</i>		<i>Alabama</i>	
	<i>Average scale score</i>	<i>Below basic (%)</i>	<i>Average scale score</i>	<i>Below basic (%)</i>
All students	282	31	269	43
White	292	20	279	30
Black	260	53	249	65
Hispanic	268	43	262	50

Another aspect of these skill levels is their impact on economic growth. For both the nation as a whole and for Alabama, long-run economic growth depends largely on the skills of the labor force.⁵ The United States as a whole has challenges, because other countries have more-skilled labor forces, which raises doubts about the future competitiveness of the US economy. Within that broad picture, the picture holds at the level of US states.

Figure 3 shows how NAEP scores of the labor force in each state relate to economic growth from 1970 to 2010. While a variety of differences across states contribute to differences in growth rates, the skills of the population are central to growth.

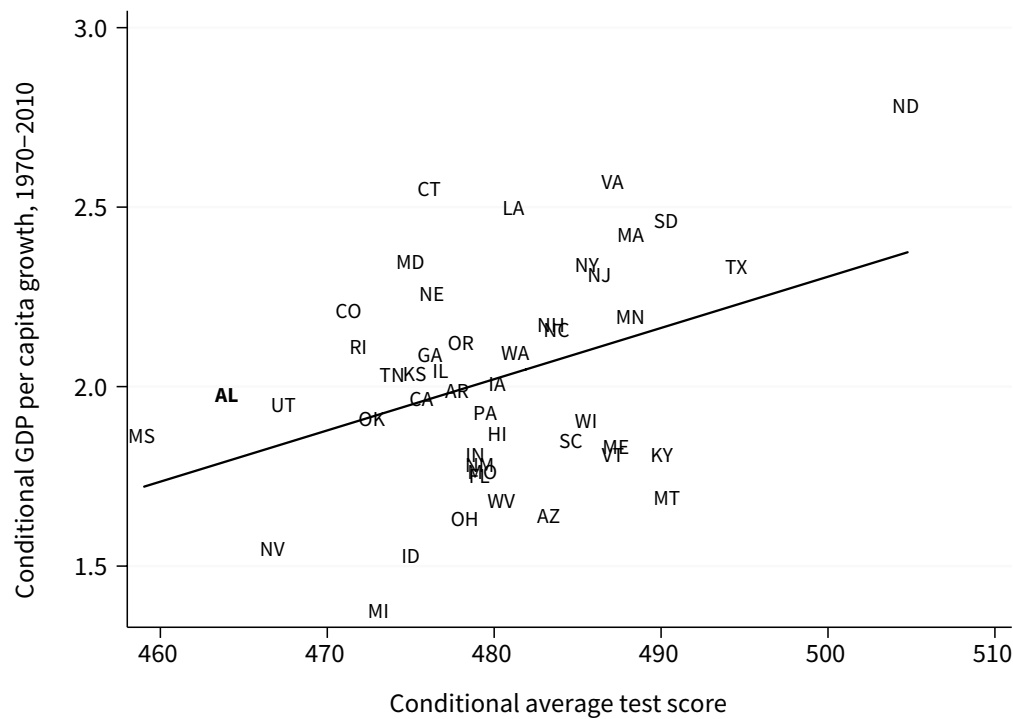
The relationship of skills and growth is very strong, and improving schools—improving the skills of the future labor force—would lead to large economic gains. For example, according to the historical impact of skills on growth (seen in figure 3), the gross state product per capita would average 6.3 percent higher over the remainder of the century if Alabama students could improve to the level of Kentucky students (the highest-performing state in the region).

These projections look at the performance of students before graduation from high school and before college. Couldn't similar results be obtained by sending more Alabama students into postsecondary education? Unfortunately, the existing evidence does not support this alternative very well. What students know and can apply after college remains quite closely related to what they know going into college. The international evidence makes this clear: Just adding more college graduates does not change the importance of learning earlier, because learning is cumulative and builds on earlier skills.⁶

It is also the case that the COVID pandemic has heightened the importance of improving K–12 schools. The school closures combined with the heterogeneous return to schools for the 2020–21 school year have left the current group of students noticeably worse off. The learning losses suffered by current students, as described by the Center for Research on Education Outcomes (CREDO), have been large but uneven.⁷ The CREDO estimates for the impact of school closures obviously underestimate total losses, which includes the past academic year.



Figure 3. Long-run state and NAEP score



The learning losses imply large economic losses to the current cohort of students. The closure period of 2020, according to historic earnings patterns, imply 3 percent lower lifetime earnings for the average student.⁸ This will be significantly larger for disadvantaged students, who suffered larger learning losses. The data for the 2020–21 school year are not fully known, but the additional learning losses mean that lifetime losses are likely to be 6 to 9 percent for the average current student and again even higher for disadvantaged students.

These learning losses from the pandemic underscore also that the labor force in Alabama will not be as skilled as it would have been without the pandemic. Thus, without any improvement for these students, the future growth of the Alabama economy will be less than historic rates. In particular, the average gross state product can be expected to be 3 to 4 percent lower for the rest of the century if the schools manage just to return to 2019 levels but do not improve over those prior levels.

This is a permanent economic loss if the schools only return to the 2019 levels and do not improve. The affected cohort of students will suffer permanent harm and the aggregate economy will be burdened by a less-skilled labor force. It can only be ameliorated by improving the schools over the pre-COVID levels.

A prime difficulty is that these economic effects are not immediate, making them easy to overlook. The situation is somewhat akin to high blood pressure—the silent killer. It is not noticeable until it is too late to correct and its impact is felt. This also implies that politicians—facing election cycles that will not fully see the impacts of any school improvements—are likely to look to fast maturing policies. But the existing research suggests that there is no getting around the need for a skilled and educated population if the economic well-being of the future is to be improved.

Summary of Findings

The long-run challenges for economic development in Alabama are severe. They are not likely to be met without a noticeable improvement in the primary and secondary schools. It is possible to jump-start parts of the development process by developing the existing resources of Alabama and by attracting skilled people from elsewhere. But sustaining this development, again, goes back to developing the state's own children.

Meeting the Challenge

Experience and research provide strong overall guidance on improving the quality of K–12 schools. But it is guidance that also requires considerable local development and adaptation.

At a fundamental level, the key elements of strong programs are highly effective teachers and personalized learning for each student. There is overwhelming evidence from across the country that quality teachers and leaders are the single most important element of a quality school. For example, a study conducted in Gary, Indiana, examined learning growth of disadvantaged students in elementary school classrooms and found that the best teachers added one and one-half years of learning each academic year, while the poorest added just one-half a year of learning.⁹ Thus, across classrooms in the same school, the *difference* in achievement amounted to one full year of learning each year, depending on which teacher the student had.

Combined with effective teachers is the necessity of engaging with individual students. Any classroom has a range of students in terms of their preparation for the material in the grade. These differences in preparation were clearly made larger by the closures and uneven return to school during 2020–21. It is important to recognize these differences if the outcome is to be high performance by all students. Meeting students at *their* starting points requires personalized approaches.

These two elements interact with a third—technology. First, attempts to personalize learning have not always been successful in the past, in part because it requires both considerable teacher skill and a good appreciation for the learning of each child. This reality, however, interacts with recent experience. Because of the pandemic, enormous investments have



been made in both the technology itself and in how to help teachers use the technology. An important potential beneficiary of the use of technology is personalized learning.

As schools move forward from the pandemic, technology will almost certainly be an important element and the new technologies to help teachers will almost certainly be better than what existed in the past.¹⁰

Nonetheless, just identifying these elements of highly effective schools does not ensure that they can be effectively applied across different schools. Different schools have both different demands and different capacities. It is difficult simply to legislate good teachers or individualized instruction or to ensure that the best technology gets used. Instead, the common approach wraps up efforts in specific programs or policies.

Two historically common approaches are regulating teacher preparation and licenses and using teacher salaries to attract high-quality teachers. Unfortunately, neither of these has proved very successful. First, the requirements for teacher certification typically do not mirror what is needed to be an effective classroom teacher.¹¹ Nor do requirements for teacher preparation programs.¹² It has proved to be very difficult to improve teacher effectiveness through regulating the entry to teaching. Second, teacher salaries—by tradition and by contract—typically are closely related to the amount of teaching experience and to the graduate degrees of the teacher. Yet, neither of these factors is closely related to effectiveness in the classroom.¹³ Many studies have shown that the probability of being a great teacher is independent of whether the teacher possesses a master's degree or not. Additionally, except for general improvements in the first few years of teaching, added experience is not consistently related to the classroom performance of teachers. Just paying existing teachers more has little impact on student learning.¹⁴

What has proved more successful is providing direct incentives for better performance. For example, in a large-scale and ongoing program, Washington, DC, has addressed the importance of having a highly effective teaching force. The IMPACT program of the District of Columbia Public Schools uses a very sophisticated rating system for teachers to determine large rewards for the best teachers and dismissal for the least effective teachers.¹⁵ This program has been shown to lift the performance of students. The Dallas school district has combined a sophisticated evaluation of teachers with incentives as a means of attracting high-quality teachers to the lowest performing schools.¹⁶ The program has shown that such incentives can effectively turn around such schools. As a result, the Texas Legislature developed a statewide program to provide incentives for other districts to emulate this incentive approach.

Such programs and incentives have demonstrated that there are clear ways to improve the performance of students. But they have not been widely reproduced in other districts, suggesting that local implementation is very important.

A Proposed Plan

A primary lesson from Alabama and other states is that there is no simple policy or program that will lead to steady and sustained improvement of schools, despite the considerable attention given to the improvement of K–12 education. And even where there is documented success, such as that in Washington, DC, there has been limited transfer to other locations.

The main problem does not seem to be a lack of ideas and proposals for improvement. Indeed, there is vast experimentation and investigation of ways to improve learning, contributed by parents, teachers, schools, districts, and states. This experimentation and search for ways to improve the schools is happening regularly in Alabama and in the other states.

One key piece that is missing is a way to sort through the successes and failures and to use past experience to develop better school designs. It is in practice very difficult to look at a new or ongoing program or activity in schools and decide whether it is successful in improving student outcomes. While the participants may be happy or unhappy with the experience, it is hard to know whether the results for students are good or bad. This is because it may be possible to assess the achievement of students in a given program, but it is difficult to know what they would have done outside of the given program. As a result, programs may be retained, modified, or discarded without clear understanding of how they impacted student outcomes.

An overarching potential solution to this problem (at least for major programs and policies of the state) is the development of an Alabama Education Laboratory charged with regular evaluation of programs in the state. The idea is to have an independent unit that has both the expertise at and responsibility for judging the efficacy of different programs introduced to improve Alabama K–12 education. The Alabama Education Laboratory could have a research agenda to review some programs regularly along with the flexibility to focus on selected programs as times and circumstances evolve.

This capacity has not previously developed in Alabama. While there have been scattered examples of relevant research and evaluation at the state’s Department of Education and across various parts of in-state universities, there is no institution or place where there is consistent and systematic evaluation of Alabama school programs. And in general the state is not well positioned to have such evaluations. For example, the Department of Education has never released individual student data that can be used for such analyses.

This is an opportune time to establish an ongoing, independent evaluation institution. Funds for the establishment of a new institution can be secured from the significant amount of education funding that is flowing to Alabama from the American Rescue Plan.



By using these onetime special purpose funds to establish initial funding for the laboratory, it is possible to ensure a flow of analysis and ideas into the future—and thus to establish the general principles of continuous improvement of the schools.

Similar activities have developed in a number of other places.¹⁷ They have contributed to the development of policies that bring programs to scale in the states. For example, evaluations of the Dallas program that incentivized effective teachers to work in disadvantaged schools contributed to the development of a statewide program to reproduce the approach in other Texas districts. And rigorous analysis of the Tennessee reforms in teacher evaluation has supported its continuation as a state policy.

The exact structure of these differs, but several features are key to their usefulness and thus would be replicated by the lab.

1. These institutions are structured to provide secure data storage and use and to ensure confidentiality of protected individual records. Thus, the work can be done with confidential administrative data currently available in Alabama.
2. Their work plans were developed in consultation with the existing educational institutions—the state departments and the individual district administrations. Specifically, individual projects are approved by the relevant governmental body, even though the exact focus can be initiated by either the laboratory or the educational institution.
3. The results of any analysis are made public and are not subject to any censorship.¹⁸ Sponsoring educational institutions are given advance copies of reports or publications in order to ensure accuracy and preclude surprises, but the integrity of the evaluation process is guaranteed by public release of any analysis.
4. The lab would produce its own work and facilitate work by outside researchers. The nature of the evaluation and policy issues surrounding schools means that states can gain from considerable work on Alabama issues that is funded by others—philanthropies, federal research agencies, and others. The lab can be an important way to attract this kind of “free” research and evaluation.
5. The lab would take responsibility for vetting the scientific integrity of proposed work. This requirement is designed to make sure that unsound analyses are not pursued by either lab personnel or outside researchers.
6. The lab would work with the legislature and the Department of Education to design appropriate evaluations of new programs before they are implemented. By working with programs before they begin, it is possible to get baseline information and

establish appropriate control groups for evaluations, thus obtaining the most useful information about the effectiveness of new initiatives.

7. The lab would be charged with providing a biennial report on the state of Alabama education. This report would assess the level achievement of Alabama students, their graduation from high school, and their entry into college and careers. In this, it would provide detailed analysis of the progress of students toward meeting the overall goals of Alabama's plan under the Every Student Succeeds Act (ESSA) along with an update on the results of its various evaluations and research activities.
8. The lab would be charged with reviewing existing scientific research in currently relevant policy areas and with ensuring that the relevant policy makers are aware of the state of research and evaluation in their areas.

This lab would be an independent organization overseen by an Alabama institution of higher education. By being independent of the current policy makers in the state, the lab would operate under an impartiality that would be vital to its credibility.

The Alabama Education Laboratory would be established by the Alabama legislature. This legislation would set out the charge to the organization and ensure access to student and institutional data. Its base funding would come from American Rescue Plan funds. Ongoing research and evaluation would be provided by a combination of future state appropriations, state and federal grant making, and philanthropic grants.

Conclusions

The long-run economic development of Alabama depends on the quality of its labor force, and the Alabama K–12 schools are central to the development of a high-quality, competitive labor force. Without effective schools, Alabama will be unable to have sustained economic development.

There are immediate ways to improve the educational opportunities—such as the broadband initiative described elsewhere in this report and the recently passed STEM initiative of Chairman Bill Poole. But their long-term success depends on establishing a program of continual improvement where the components of these and other policy initiatives are systematically evaluated and improved. Right now, Alabama lacks a process for identifying effective programs, for expanding on success, and for eliminating poorly performing policies.

The development of an Alabama Education Laboratory as an independent evaluation center would provide a way of institutionalizing the research and evaluation of Alabama schools. It can be mandated by the legislature and initially funded by federal funds from the American Rescue Plan.



NOTES

- 1 A description of the NAEP assessment program along with access to historical data can be found at <https://nces.ed.gov/nationsreportcard>.
- 2 “The NAEP Mathematics Achievement Levels by Grade,” National Assessment of Educational Progress, last updated October 22, 2019, <https://nces.ed.gov/nationsreportcard/mathematics/achieve.asp>.
- 3 Paul E. Peterson, Ludger Woessmann, Eric A. Hanushek, and Carlos X. Lastra-Anadón, “Are US Students Ready to Compete? The Latest on Each State’s International Standing,” *Education Next* 11, no. 4 (Fall 2011): 51–59.
- 4 Eric A. Hanushek, Guido Schwerdt, Simon Wiederhold, and Ludger Woessmann, “Returns to Skills around the World: Evidence from PIAAC,” *European Economic Review* 73 (January 2015): 103–30; Eric A. Hanushek and Ludger Woessmann, *The Knowledge Capital of Nations: Education and the Economics of Growth* (Cambridge, MA: MIT Press, 2015).
- 5 Hanushek and Woessmann, *Knowledge Capital of Nations*; Eric A. Hanushek, Jens Ruhose, and Ludger Woessmann, “It Pays to Improve School Quality,” *Education Next* 16, no. 3 (Summer 2016): 16–24; Eric A. Hanushek, Jens Ruhose, and Ludger Woessmann, “Economic Gains from Educational Reform by US States,” *Journal of Human Capital* 11, no. 4 (Winter 2017): 447–86.
- 6 Eric A. Hanushek, “Will More Higher Education Improve Economic Growth?,” *Oxford Review of Economic Policy* 32, no. 4 (2016): 538–52.
- 7 Center for Research on Education Outcomes (CREDO), “Estimates of Learning Loss in the 2019–2020 School Year,” October 2020, <https://credo.stanford.edu/publications/estimates-learning-loss-2019-2020-school-year>.
- 8 Eric A. Hanushek and Ludger Woessmann, *The Economic Impacts of Learning Losses* (Paris: Organisation for Economic Co-operation and Development, 2020).
- 9 Eric A. Hanushek, “The Trade-Off between Child Quantity and Quality,” *Journal of Political Economy* 100, no. 1 (February 1992): 84–117.
- 10 Incorporating new technology does face special challenges in many Alabama locations because of the uneven distribution of broadband access. See the separate discussion and recommendations about this in this volume.
- 11 Eric A. Hanushek and Steven G. Rivkin, “Teacher Quality,” in *Handbook of the Economics of Education*, vol. 2, ed. Eric A. Hanushek and Finis Welch (Amsterdam: North Holland, 2006), 1051–78.
- 12 Thomas J. Kane, Jonah E. Rockoff, and Douglas O. Staiger, “Photo Finish: Certification Doesn’t Guarantee a Winner,” *Education Next* 7, no. 1 (Winter 2007): 60–67.
- 13 Eric A. Hanushek, “The Single Salary Schedule and Other Issues of Teacher Pay,” *Peabody Journal of Education* 82, no. 4 (October 2007): 574–86.
- 14 A rationale for increasing teacher salaries across the board is that it will lead to better-quality entrants into the teaching profession. There is some support for this, because teaching competes with other occupations such as law, medicine, and business for talented people; see Eric A. Hanushek, Marc Piopiunik, and Simon Wiederhold, “The Value of Smarter Teachers: International Evidence on Teacher Cognitive Skills and Student Performance,” *Journal of Human Resources* 54, no. 4 (Fall 2019): 857–99. But the impact of a strategy of higher overall pay would take a long time before it had an impact on school outcomes, and the impact would by prior evaluations be much smaller than that from more focused pay policies; see Thomas S. Dee and James Wyckoff, “Incentives, Selection, and Teacher Performance: Evidence from IMPACT,” *Journal of Policy Analysis and Management* 34, no. 2 (Spring 2015): 267–97; and Thomas S. Dee and James Wyckoff, “A Lasting Impact: High-Stakes Teacher Evaluations Drive Student Success in Washington, DC,” *Education Next* 17, no. 4 (Fall 2017): 58–66.
- 15 Dee and Wyckoff, “Incentives, Selection, and Teacher Performance”; and Dee and Wyckoff, “A Lasting Impact.”

16 Andrew Morgan, Minh Thac Nguyen, Eric A. Hanushek, Ben Ost, and Steven G. Rivkin, “Getting Effective Educators in Schools Serving Disadvantaged Students,” paper presented at Association for Public Policy Analysis and Management, Washington, DC, 2018.

17 A majority of states currently provides access to student-level data to researchers in order to do research and evaluation. (See, for example, the cross-state studies of individual student performance from CREDO: <https://credo.stanford.edu>.) Individual laboratories have operated for many years in, for example, Texas, North Carolina, Michigan, New York City, and New Orleans.

18 Presentation of results is, of course, controlled to ensure that no confidential information about students is disclosed.

About the Author

Eric A. Hanushek is the Paul and Jean Hanna Senior Fellow at the Hoover Institution. He has been a leader in the development of economic analysis of educational issues. His widely cited research spans many policy-related education topics, including the economic value of teacher quality, the finance of schools, and the role of education in economic growth.

