6. The World Is a Lab

Innovation in Schools after A Nation at Risk

Eric Bettinger

Executive Summary

Education needs innovation. *A Nation at Risk* applauded the notion of schools and districts as local laboratories, where they could develop, scale, and eventually disseminate innovative practices. This chapter reviews how innovation in the organization and delivery of education, both inside and outside of the classroom, has affected the quality of education. No review can cover the full range of innovative practices, and I focus attention on districtwide innovations such as the small schools initiative, magnet schools, superstar superintendents, and innovation zones. On in-school innovations, I review evidence on class size and instructional time. In each case, I demonstrate how local experimentation led to adoption and expansion of particular practices. For example, success with small schools led to massive philanthropic and government investment across states and municipalities.

However, while many of the innovations show promising results in local experiments, scaling and expansion have not always replicated local success. While the conditions of local experimentation focus on questions of efficacy in terms of improving educational outcomes, policymakers have to consider cost-effectiveness. A major reason for the unsuccessful expansion or replication of local results is that the cost of the innovative practices can be prohibitively large. Schools and districts must often sacrifice other programs to transfer funds to these innovative practices. Moreover, local labor markets cannot always provide the teachers, administrators, and infrastructure needed to replicate the results from local experimentation.

While *A Nation at Risk* was correct that local school systems are laboratories, the process of adopting, expanding, and scaling local experiments has proven more difficult because of the conditions required to replicate the innovation. While administrators can look for solutions in

experiments conducted throughout educational systems globally, adoption of these practices should consider local contexts. Moreover, administrators should verify that the new programs can replicate the prior results when scaled and transferred.

- Innovations that promise to revitalize American education gain attention and often are promoted elsewhere with massive investment.

- Seldom do these innovations accomplish as much elsewhere as they did in the original experimentation, partly because the cost to implement is often prohibitively large.

- Finding innovations that can be replicated at scale is the next challenge to be solved.

• • •

Education thrives on innovation. While core practices in education have slowly and incrementally changed over time, the innovation and creativity of teachers and administrators have facilitated improvements by modifying the organization and delivery of education. In calling for solutions, *A Nation at Risk* (*ANAR*) repeatedly called on local "political and educational leaders to search for solutions" and to use the "ingenuity of our policymakers, scientists, State and local educators, and scholars in formulating solutions" (NCEE 1983, 12, 15). Indeed, *ANAR* lauded the "local laboratory" model that decentralized schooling affords to test new models that could scale and disseminate throughout the country. This chapter takes aim at understanding how innovation in the organization and delivery of education both within and outside the classroom has affected the quality of education.

I start by looking at large-scale initiatives that sought to modify the ways school districts organized themselves. For example, the Bill and Melinda Gates Foundation provided significant funding for the small schools or the "school-within-a-school" initiative. The initiative sought to divide large high schools into smaller sub–high schools that might provide a greater cohort experience and allow for greater interaction between teachers and groups of students. After reviewing small schools and other out-of-the-classroom innovations, I turn my attention to innovation within the classroom. Since *ANAR*, major evidence on class size and the timing of schooling, among other innovations, has influenced policy and practice. This has affected how states and local districts organize and deliver education to students inside schools and classrooms. I review evidence on these and other innovative practices.

It is impossible to really track forty years of innovation across thousands of school districts. Many innovations were never disseminated, scaled, or evaluated. Other innovations became so popular and widespread that the editors of this series chose to dedicate entire chapters to them. For example, the rapid changes in technology with computers and the integration of standards and accountability systems are two innovations that have altered every classroom across the United States. In this series, Tom Vander Ark's chapter on technological innovations and Michael J. Petrilli's chapter on standards and accountability review these innovations and how they have shaped school organization, classroom practice, and teacher and principal

accountability (see chapters 7 and 11, respectively). This chapter provides a useful companion to those chapters.

In this chapter, I focus on four sources of system innovation and two sources of classroom innovation. For system innovation, I review evidence on small schools, magnet schools, superstar superintendents, and innovation zones. For classroom innovation, I discuss evidence on class size and the duration of schooling. In choosing the specific innovations, I have conveniently sampled practices that have expanded beyond a single district or school and have thereby shaped and influenced education policy and practice. I also try to focus on innovations where rigorous research has provided some hint as to the causal impacts of these policies.

While many of the innovations seem to have strong evidentiary bases, they remain seemingly underutilized. In some cases, the costs of the interventions remain prohibitively large. In other cases, the modifications needed to establish the interventions at scale compromise the capacity of the interventions to affect outcomes. I discuss other impediments to expansion, and more generally I discuss obstacles that inhibit the use of the "school laboratory" model.

SYSTEMS INNOVATION

"Systems innovation" refers to new policies and practices that modify governance and the structure of school systems. The specific innovations upon which I focus are those in school organization, creation of specialized schools, school leadership, and innovation zones, which provide schools and districts latitude to implement new practices and policies.

SCHOOL SIZE AND ORGANIZATION

Perhaps the most notable of the systemwide changes was the small schools movement. In the early 2000s, nearly twenty-six hundred small schools were created nationwide (Ravitch 2008). One of the major forces behind this investment was the Gates Foundation, which began in the early 2000s to fund the decomposition of large high schools. Based on its interpretation of existing literature, the Gates Foundation encouraged schools to maintain a size of four hundred students. As Tom Vander Ark, who at that time was executive director of education at the Gates Foundation, said, "Young people who attend smaller schools that provide a rigorous, personalized education and enable close relationships with adults are more likely to graduate and continue their education" (Bergstein 2003). The basic theory was that personalized education and deeper relationships with teachers would improve the quality of education and provide better role models and coaching as students began considering and then pursued subsequent education.

Unfortunately, the short-term results did not generate the anticipated results. Over nine years, the Gates Foundation invested more than $2 billion in creating small schools, and in 2009, it "refined" its strategy. As Bill Gates wrote: "[M]any schools had higher attendance and

graduation rates than their peers. While we were pleased with these improvements, we are trying to raise college-ready graduation rates, and in most cases, we fell short" (Gates 2009).

Indeed, the short-term evidence on small schools was a bit pessimistic (Ravitch 2008). At the time that Gates was making allocative decisions, the evidence was not strong. However, the tide of positive evidence was soon to come. Studies by Bloom et al. (2010), Schwartz et al. (2013), Barrow et al. (2013), and Abdulkadiroğlu et al. (2013) found positive, long-run impacts. The study by Abdulkadiroğlu et al. (2013), the only one that took advantage of randomized admission lotteries, reported that college attendance rates in New York improved by seven percentage points, with additional improvements in math and English scores on the state's High School Regents Examinations. Additional work by Schwartz et al. (2013) argued that small schools improved the performance of most New York high schools, *including* schools that were not small schools.

Yet despite the positive, long-run evidence on small schools, they are no longer receiving the same public and philanthropic support they did in the past. Strong evidence has not revitalized the initiative or the funding streams. While existing small schools have remained, few additional small schools have been added. Why the lack of continued or renewed support?

First, there was a perception that lessons could be applied and scaled up in other settings that did not require small schools. For example, one theory as to the success of small schools relied on the notion that students developed rich, meaningful, personalized relationships with faculty and counselors. However, such relationships may be possible in other settings as well. As Robert Hughes, director of K–12 Education at the Gates Foundation, explained, "[W]ith some work, you can really build structures that enable kids to be known and to get the kind of support they need to be successful [even] in larger schools" (Kolodner 2015). Also, small schools cost more per student (Schwartz et al. 2013) than traditional schools. If traditional schools can replicate the counseling and other relationship-based mechanisms, then expanding small schools, a far more expensive and involved intervention, may not be necessary. Indeed, the fact that all schools in a school district, including large schools, benefit from the presence of small schools suggests that small schools increase the visibility of some mechanisms that can be transferred to larger schools.

Second, there have been concerns about the capacity of institutions to scale small schools. One concern is that the cost of staffing might be prohibitively large (Schwartz et al. 2013). Another concern is that small schools raised the demand for both teachers and principals, and it is unclear that the supply of new teachers and qualified principals can satisfy the demand.

While small schools remain somewhat stalled, there are several aspects of the small schools movement that have had a lasting impact. For example, it was one of the largest, highest-profile experiments in innovating the structure and design of schools. This gave some momentum to districtwide interventions and experimentation, expanding the scope of the laboratories envisioned in *ANAR*. Also, as mentioned above, it provided significant information about

reforming underperforming schools that could be applied in other settings. And there was also important heterogeneity in the impacts that provided additional policy lessons about the implications of certain types of schools—namely charter schools, which generated significant impacts. For example, the KIPP schools were cited by Gates in the 2009 announcement that the Gates Foundation was refining its investment strategy. Subsequent work such as Abdulkadiroğlu et al. (2013) demonstrated that there were specific strategies (e.g., high accountability) employed by charter schools that may have led to the greater impacts observed in some small schools as opposed to others. Each of these lessons reinforced the notion that school districts could be local laboratories for innovation.

SPECIALIZED SCHOOLS

A second strategy that altered the ways districts organized schools had to do with school choice and the underlying supply of schools. In this series, the chapter by John D. Singleton focuses extensively on school choice (see chapter 10), so I defer any discussion of charter schools and vouchers to that chapter. My discussion here centers on magnet schools. While many charter schools behave like magnet schools and vice versa, the administration of magnet schools typically continues under the direction of school district offices, whereas the administration of charter schools often moves outside the district's purview.

Magnet schools existed long before *ANAR*. As districts grappled with how to desegregate schools, many created specialist or alternative schools to give parents additional options. The first magnet schools began in the late 1960s. The first large-scale experiment occurred in 1970 in Minneapolis (Waldrip 2023), and the first specialized high school, focused on career themes, opened in Dallas in 1971.

As of 2016, there were 4,340 magnet schools across the United States, with the most common theming centered on science, technology, engineering, and mathematics (STEM); fine and performing arts; international baccalaureate; career and technical education; and world languages. Whereas before *ANAR*, magnet schools were often considered as a way to encourage desegregation, the major expansion and specialization of magnet schools took place after *ANAR* with greater emphasis on school choice.

The magnet school expansion happened for a variety of reasons. Some of it was driven by parents as they tried to find ways to improve their children's educational performance by building on specific skills. Some of it came as magnet schools, particularly vocation-oriented magnet schools, demonstrated that they could have positive impacts on students who were struggling in mainstream classrooms.

To date, the evidence on magnet schools is largely positive. Gamoran (1996) uses the National Education Longitudinal Study to compare test scores of students at magnet, public, and private schools. Gamoran found that students at magnet schools score higher in science, reading, and social sciences. Crain et al. (1998) use oversubscription lotteries to measure the impact of career-oriented magnet schools. The researchers provide mixed evidence. On the one hand, career magnet schools had lower graduation rates than comprehensive schools.

This was the result of greater emphasis on career and vocational curricula. On the other hand, students who attended magnet schools reported fewer "reckless adolescence behavior" at age twenty. Kemple and Snipes (2000) provide evidence that career magnet schools are an effective way to reduce dropout rates among those at the highest risk not to graduate. A synthesis of the literature suggests that impacts are "generally positive" (Wang et al. 2018).

Magnet schools were refined in the laboratory of public schooling, and new iterations of magnet schools build upon the principles of school choice discussed by Singleton (in chapter 10) and on principles of innovation. Career education in particular has become much more central to education policy. As the returns to high school education have stagnated, emphasis on employability and skills has fueled much of the advance in career education. This concern not only has been present in the United States but also has become increasingly popular as a policy tool in developing countries (see review in MacDonald and Dunbar 2015). The evidence from magnet schools provided significant lessons that shaped early attempts to strengthen vocational education.

Magnet schools also raise the question as to whether education should be similar across students. In many ways, the traditional school model presents very little variety across the types of skills that students develop; however, magnets exist to allow some students to specialize beyond what a traditional school might allow. Heterogeneous students might need more heterogeneous offerings than traditional schools can provide. Magnet schools might be a way to improve the efficacy of education for a subset of students, and there may be limits to the degree of differentiation among students and schools that are possible. Hence, the gains could be large but diminishing as differentiation expands.

In the short run, magnet schools' enrollment and presence will continue to expand. Whereas they were at one point an answer to desegregation and integration of schools, they are increasingly a means for parents to express their preferences in terms of students' education opportunities. Their growth continues, and while charter school enrollment remains larger, magnet schools remain a viable way to provide differentiated education opportunities. Moreover, as charter schools become more specialized (e.g., STEM or vocation focused), the line dividing magnet and charter schools will continue to blur.

SCHOOL LEADERSHIP

Another trend that has taken place since *ANAR* is the increased emphasis on high-profile school district superintendents. In many large school districts, superintendents have become chief executive officers with greater power and salaries. For example, Barbara Byrd-Bennett served as the CEO of both Cleveland Public Schools and, later, Chicago Public Schools. She previously served in a leadership capacity for New York City schools. Her compensation in both Cleveland and Chicago was controversial, given the size of the packages (O'Donnell 2012).[1] Other CEOs grabbed headlines and made national news as well, such as Michelle Rhee in Washington, DC, and Arne Duncan in Chicago Public Schools. In districts with more than twenty-five thousand students enrolled, superintendent compensation ranges from $140,000

to almost $400,000 (McCord and Finnan 2019). To put this in perspective, the median base salary for a beginning teacher in districts of the same size is $44,150.

Prioritizing hiring high-profile CEOs with extensive experience and increasing their compensation has been a prevailing societal trend (Bivens and Kandra 2022). Just as CEOs' track records were believed to have an impact on a company's performance, schools sought to enhance their quality by appointing elite superintendents who would bring about substantial improvements and elevate the institutions they served. Hence, an increasing number of school districts applied corporate strategies to superintendents. In the corporate world, there was a perception that the supply of such leaders was finite, leading to bidding wars and large compensation. The emphasis on superstar superintendents faced the same competition and compensation.

However, as Chingos et al. (2014) demonstrated, superintendents who bring about significant, statistically reliable changes in student achievement within their districts, while controlling for other factors that affect academic performance, are indeed rare. They found that superintendents account for only a tiny fraction (0.3 percent) of student differences in achievement, significantly less than other factors such as student characteristics, teachers, schools, and districts. They further indicated that student achievement does not improve with longer superintendent service, and hiring a new superintendent does not lead to immediate gains in student achievement.

Increased emphasis on superintendents may not directly yield higher test scores, but nevertheless it remains an area of continual research. For instance, Hart et al. (2019) proved that encouraging superintendent longevity can support student achievement, as those with more in-state experience possess a comprehensive understanding of the state's curriculum, testing programs, and the organizational stability required for effective leadership. Mitigating superintendent turnover, as suggested by Grissom and Mitani (2016), could involve considering salary increases, particularly in smaller and rural districts and those with lower student achievement, as this would help retain superintendents who are often lured by higher-paying positions in larger, more urban districts with better academic performance.

The hiring and reliance on superstar superintendents is very much an experiment in progress. While some districts have moved away from the strategy of hiring CEO-like superintendents in favor of other approaches, there are still districts that continue to explore this path. Ongoing research and the findings regarding superintendent longevity and compensation emphasize the importance of considering contextual circumstances being faced or the necessity of exploring alternative strategies.

INNOVATION ZONES

While the principles of innovation zones may have been part of the policies dating back to the early 1990s, states and school districts began implementing legislation in the mid-2000s. Innovation zones are schools or districts to which states or districts grant greater

autonomy over curriculum, budgeting, and staffing. Typically, states and districts grant innovation zones additional relief from other state and local regulations. While schools are free to enact policies and practices that differ from the norm, the schools are held accountable for improvements in student outcomes. After some early experimentation, innovation zones began expanding, and by 2017, they covered more than 108 schools and 63,000 students (Iyengar et al. 2017).

Innovation zones presuppose that regulation and centralization impair the ability of a district to try new and innovative practices. By providing greater autonomy, schools and districts can explore new practices in finance, governance, curriculum, and staffing. This greater autonomy comes at the cost of higher accountability for student outcomes, and schools and districts can lose the autonomy if student outcomes do not improve. More generally, innovation zones are just one category of school turnaround.[2] Under the Race to the Top (RttT) legislation, the federal government funded school turnaround strategies that included other variants such as school improvement grants or No Child Left Behind (NCLB) waivers. These school turnaround programs also allowed school districts to have more autonomy in some aspect of staffing, management, and curriculum (see, e.g., the cases of New Orleans in Ruble 2015 and Philadelphia in Gill et al. 2007).

Many studies of innovation zones are emerging. Zimmer et al. (2017), for example, examine the innovation zones established in Memphis, Nashville, and Chattanooga, Tennessee. They showed that innovation zones significantly outperformed other public schools and other alternative methods of changing governance. Math scores, for example, increased by 0.20 standard deviations in innovation zones relative to other schools. Science and reading scores also increased. Zimmer et al. (2017) argue that one of the largest mediating factors in the innovation zone was the retention of experienced, successful teachers. Innovation zones in Tennessee generally offered significant raises for teachers who transferred to innovation zone schools. Teachers who previously had significant value added in the classroom were more likely to shift into these innovation zone schools. While the competition for high-achieving teachers may be a zero-sum game in the short run, the responsiveness to compensation incentives alongside the added autonomy may strengthen the overall workforce by inducing the retention and recruitment of top teachers.

The use of innovation zones and other strategies aimed at strengthening school autonomy remains a hot topic. In this series, Michael T. Hartney, for example, explores other innovations in governance and how they have played out (see chapter 9). While the current scale of innovation zones is low, the case of innovation zones is interesting as the initial results have encouraged continued expansion, with at least twenty-five states having adopted policies encouraging innovation zones in districts that were previously classified as failing and more considering legislation to allow innovation zones (see Jones and Chambers 2021).

The expansion of innovation zones raises questions about teacher supply. If, as Zimmer et al. (2017) argue, the mechanism by which innovation zones improve outcomes is through attracting top teachers at the cost of having other schools lose top teachers, then innovation zones

might lead to a continued division between high-value-added teachers and others. If the higher wages and reduced legislation in innovation zones serve to attract more (and better) teachers to the profession, then innovation zones might generate momentum toward improving the overall teaching pool. However, if this does not happen, then the competition for teachers is a zero-sum game in which the available teachers for underprivileged schools will be disadvantaged relative to those who want to attend innovation zone schools.

Finally, the continued expansion of innovation zones has two implications for the future. First, the continued expansion of legislation allowing innovation zones suggests that these zones will become increasingly visible in the future. Second, given that the emphasis on innovation zones is both deregulation and expanded accountability, it also suggests a growing discontent with the existing regulations in traditional school districts. Innovation zones are a means of circumventing some regulations. If innovation zones eventually create momentum around deregulation, then deregulation might displace (or potentially devalue) innovation zones.

CLASSROOM INNOVATION

I next turn to classroom innovation. I focus on two separate innovations—class size and the timing of schooling. As before, these are only a fraction of the possible innovations that I could use; however, these are two areas where significant experimentation and subsequent policy implementation have happened since *ANAR*.

CLASS SIZE

Scholars from all disciplines have long postulated that class size affects student outcomes. The underlying theory suggested that teachers can give more attention to students in smaller classes and that this extra attention might provide a boost in students' education outcomes. Lazear (1999), for example, uses a model to demonstrate that the probability of classroom disruptions likely increases as class size goes up.

However, in the mid-1980s, some doubt emerged on the relationship. In a series of papers, Hanushek (e.g., 1986, 1999) showed that estimates of the effects of class size were ambiguous. Perhaps students were not as sensitive to class size as they might have been to other inputs, or perhaps teachers used different technologies as class size changed. Nonetheless, the relationship between class size and academic achievement has been hotly contested in the education literature (see, e.g., Mishel and Rothstein 2002; Hoxby 2000; Angrist and Lavy 1999).

In 1985, then governor Lamar Alexander sponsored the Tennessee STAR experiment. The experiment created small classes in kindergarten through third grade and implemented the intervention with a school-based randomized controlled trial. The results of the experiment were stunning. Education test scores improved by roughly 0.25 standard deviations, roughly one grade level higher than students in regular classrooms (Mosteller 1995). Subsequent

research (see review by Schanzenbach 2014) suggested that the impacts endured through primary, secondary, and tertiary schooling.

Some criticisms have been made of the Tennessee STAR experiment. For example, Hoxby (2000) discusses the possibility that the results are exaggerated. She argues that they may be the result of the Hawthorne effect arising from teachers performing differently than they would have otherwise as a result of participating in a high-profile experiment. Others have refuted this characterization, calling the Tennessee STAR experiment the "Barbary steed" of the class size literature (Krueger 2003). Nonetheless, Tennessee STAR influenced policymakers. States including California, Florida, and Texas established class size limits. The policy in California in particular provided extensive financial incentives to schools that implemented class size limits (Schanzenbach 2014).

While the policy debate has leaned heavily in recent years toward reductions in class size, there have not been significant studies to date documenting whether state policies around class size have generated close to the same effects as observed in Tennessee STAR. In fact, there is some evidence that the emphasis on class size has come at the expense of other inputs. For example, Sims (2008) shows that California schools largely achieved class size reductions up to grade three by increasing class sizes in subsequent grades. He shows that the increase in test scores after grade three may have reversed potential positive impacts of class size.

The class size debates are not over and will likely continue for the foreseeable future. Until evidence can definitely show that the expansion of reduced class size through state policies leads to sustained improvements in student achievement, the debate over class size will continue. Even if Tennessee STAR's evidence shows improvements in student outcomes as a result of class size reductions, it does not mean that class size reductions can produce impacts in scaled-up policies. In the Tennessee STAR experiment, Tennessee allocated additional funds. In scaled-up versions at the state level, the cost is likely prohibitive. States have to reallocate funds toward increasing the number of teachers and away from other inputs. In the case of California, it allocated funds to increase the number of early elementary school teachers, yet the cost of this was a decrease in the funds to hire teachers in other grades, and hence, higher class sizes resulted in those other grades. This could counteract any positive impacts from class size in early grades. Indeed, there is no evidence to date that California's aggressive class size policy has led to any improvement in outcomes. The literature on class size largely focuses only on class size, but in a scaled-up policy, the improvements from class size must be weighed against the costs of reduced educational inputs elsewhere. As long as costs remain prohibitive, it is unclear whether any state can produce a class size policy that can replicate the gains from the Tennessee STAR experiment.

While *ANAR* did not necessarily take on the issue of class size, its call for local experiments to identify promising solutions resonates with the issue of class size. In considering changes in classroom practice, the debates on class size have led to significant investigations throughout the United States and beyond—not just in primary schooling but also in higher education

(e.g., Bettinger and Long 2018). However, a limitation of experimentation can be its ability to understand how the impacts would change as scaled-up versions of the policy reverberated throughout the education landscape. The formulation of policy around class size has largely proceeded without finding a solution for the costs of reduced class size, and states have sacrificed other inputs in order to accommodate class size. While innovation is present in the case of class size, pushing innovation forward without considering the costs of scaling may never generate the promised impacts.

TIMING OF SCHOOLING

One input that was specifically mentioned in *ANAR* was the length of the school day and year. *ANAR*'s authors lamented that the United States had shorter school days and school years than its competitors. The *ANAR* authors strongly recommended a seven-hour school day and a school year of two hundred to two hundred twenty days.

For at least a decade after *ANAR*, there was very little movement or experimentation with the length of the school day. In 1997, Arizona became the first state to increase the length of the school year, requiring at least two hundred days of instruction rather than one hundred eighty. By 1998, fourteen states were considering changes to the school calendar (National Center on Time and Learning 2017); however, outside of a few districts in Arizona, few changes were happening at scale.

Since 2000, though, there have been significant changes in the time allocated for schooling. Some of these have come in response to the charter school movement. For example, from 2000 to 2012, the average length of the school day nationally increased by 0.2 hours; by contrast, the average length of the school day in charter schools increased by 0.4 hours (Farbman 2015). As Farbman (2015) noted, multiple studies of charter schools and other school turnaround efforts have attributed the impacts of charter schools, in part, to the length of the school day (e.g., Dobbie and Fryer 2013; Fryer and Dobbie 2011).

Additional evidence has come from outside the United States. For example, Germany increased weekly education instruction by two hours, thereby improving outcomes, particularly for high-achieving students (Huebener et al., 2017). Studies in Chile (Bellei 2009), Israel (Lavy 2012), Italy (Battistin and Meroni 2016), Brazil (Rosa et al. 2022), and Latin America more generally (Alfaro et al. 2015) have shown similarly positive impacts of increasing instructional time. These other studies have found greater benefits for both low- and high-performing students.

Within the United States, RttT grants for school improvement often targeted limited experiments in the length of the school day and evidence to date. Some schools implemented changes in the length of the school day in response to these grants. More generally, the largest policy shifts have been in Chicago and Boston. In 2012, Chicago moved from a 5.75-hour school day to a seven-hour school day, and in 2015, Boston Public Schools approved a forty-minute extension of the school day.

While the length of the school day has been the subject of both policy changes and experimentation, there are few studies on lengthening the school year. The average number of school days has shown almost no change nationally and remains around one hundred eighty days.

What does the future hold? The mounting evidence on the impact of increased instructional time will likely increase pressure to consider policy options, particularly for students who are struggling. The continued expansion of charter schools, which have longer school days on average, will continue to put upward pressure on the length of the school day. Not only do they contribute to the increased average school day, but they also put pressure on districts to examine the amount of instruction time they offer. Areas where charter schools provide greater competition to local schools are likely to face greater pressures to increase instruction time. In terms of increasing the average length of the school year, there appears to be little momentum.

OTHER SYSTEMIC SHIFTS

While I have highlighted systematic changes that have focused on improving education quality, there are other systemic shifts that have occurred. Many of these have less to do with school inputs and more to do with the changing context of education. I briefly consider three examples.

LEARNING DISABILITIES

Learning disabilities have become more prevalent over time. Zablotsky et al. (2019), for example, report a significant increase from 2009 to 2017 in the percentage of children diagnosed with any developmental disorder, attention deficit disorder, and autism. Special education enrollment rates continue to rise (Diament 2022). Moreover, the COVID-19 pandemic increased attention on issues of mental health among students.

These changes in health have impacts on classrooms. Students with disabilities have renewed protection and have increased access to accommodations as a result of the Americans with Disabilities Act and the expansion of "504" plans. Students with disabilities are often more expensive to educate, costing as much as thirteen times that of the average student (Griffith 2008), and the increased incidence of documented disabilities puts financial pressures on schools. While schools receive additional funds for students with disabilities, the marginal cost of educating a student with disabilities is likely higher than the increased allotment. Indeed, Bergman and McFarlin (2020) showed that charter schools actively discriminate against students with disabilities in the way that they encourage (or discourage) enrollment. The reason for this discrimination is likely the disparity between the cost and revenue associated with a student with disabilities.

While the increase in disability diagnosis and treatment will certainly improve education quality for those with disabilities, the additional education expenditure required to teach students

with disabilities inevitably leads to reductions in expenditures elsewhere. Increased expansion of charter schools, if indeed charter schools discriminate against students with disabilities, could exacerbate existing inequalities by segregating students by costs. Improvements in our ability to diagnose and treat learning disabilities can reduce the costs of educating students with disabilities and reduce the fiduciary burden.

SCHOOL SAFETY

School shootings have become more commonplace, and a frequent motivation for students to pursue charter or private schools is often school safety. Since *ANAR*, the presence of police, metal detectors, and other security enhancements has shifted the ways schools behave. While the prevalence, particularly in the wake of violent shootings, seems high, in truth there has been a decline in the rate of victimization and threats to teachers from 1994 to 2016 (US Department of Education 2020).

School safety, including policies and procedures to ensure safety, continues to be a hot topic in state and federal legislation. Each school must maintain a plan for ensuring safety and for dealing with school violence.[3] As in the case of increased disability rates, a focus on school safety requires resources and attention. Governments have been reluctant to increase funding to fully cover the costs of such expenditures. The resulting policies create more pressure on schools to cut expenditures in other ways. Moreover, to date, there has been little experimentation in ways that can help identify cost-effective strategies for improving school safety. Using schools as laboratories across the United States could provide greater opportunities to learn best practices.

PARENTAL INPUTS

Education scholars have often posited that parental inputs are a significant part of students' academic achievement. While the correlation between parental characteristics is extremely strong, particularly in the case of the mother's education, few papers have established causal relationships between parental inputs and student outcomes. Many localized experiments have attempted to increase parental involvement; however, none of these efforts have scaled in any meaningful way.

There are a couple of notable exceptions in more recent years. While not occurring in the United States, the Oportunidades (i.e., Progresa) conditional cash transfer program was a major randomized controlled experiment in Mexico that targeted parents and students. Parents received a subsidy conditional on student attendance and student health visits. These programs had a demonstrable impact on student attendance and attainment (see overview in Skoufias 2001). While parents are clearly involved in the treatment, it is not clear if the effects came because of their vigilance or other factors (attendance, health, or increased family income).

Recent randomized controlled experiments have aimed at a more novel approach to encouraging parental involvement. With the expansion of texting capabilities, researchers have used

text messages to try to engage parents. York and Loeb (2014) did this for literacy among low-income parents. Through a series of text messages, York and Loeb coached parents of young children how to teach literacy skills. They found that students arrived at kindergarten with improved literacy as a result of parental engagement.

Bergman (2021) and Bettinger et al. (2022) tested interventions that focused on communicating with parents about students' academic behaviors. Parents received notes about students' truancy and assignment completion. These notes reshaped parents' beliefs and led to improvements in attendance and academic achievement. Bettinger et al. (2022) demonstrate that the saliency of the messages in informing parents of important behaviors that they should be monitoring was likely the mechanism by which this impacted student achievement. In both cases, the cost of the intervention was small relative to the benefits.

New and innovative research designs are extending more and more interventions to parents, and this remains fertile ground for the laboratory of public schools. The recent text message interventions are particularly cost-effective and may have more potential to scale.

CONCLUSION AND DISCUSSION

When I was invited to write this chapter, the charge was to document how education systems changed after *ANAR*. How does one capture forty years of trial and error, of innovation and failure? I have chosen to identify a handful of innovations within districts and within schools. These examples—using small schools, specialized schools, school leadership, and innovation zones as cases of education system innovations and class size and using the time spent in schools as cases of classroom innovation—are just a sampling of innovations that have changed, at least incrementally, the way in which education is delivered. One only needs to browse the research-related web pages of organizations such as the American Institute for Research, MDRC, Mathematica, and RAND Corporation to learn about the breadth of continued experimentation and innovation in schools.

Perhaps the most disappointing aspect of many of these interventions is their failure to be scaled up or to generate impacts when scaled up. The key problem in many cases is the cost of scaling. Oftentimes, scaled versions lack the same features as the original laboratory experiment, and in many cases, funding the scaled version requires sacrifices in other areas. Moreover, in many cases, we lack the supply of personnel or funding to move forward. Perhaps the great challenge of the next forty years will be learning how to create cost-effective versions of the innovations that laboratories produce.

ANAR envisioned an education ecosystem where experimentation and learning from the laboratories of local schooling provided lessons and accelerated the process of change. While one can debate the relative quality of education over time, education systems of experimentation and learning across organizations have greatly increased, especially with the advent of the internet and the role of social media in drawing attention to innovation and to evidence.

The What Works Clearinghouse and other formal and informal collections of evidence on innovative practice and policy only accelerate the role of education institutions as laboratories in identifying promising practices and moving them to scale. However, finding and scaling the products of these laboratories remains the next challenge to be solved if the vision of schools as laboratories is to yield long-run improvements in the quality of education.

HESI PRACTITIONER COUNCIL RESPONSE

Essays in this series were reviewed by members of the Hoover Education Success Initiative (HESI) Practitioner Council. For more information about the Practitioner Council and HESI, visit us online at hoover.org/hesi.

What Bettinger shows convincingly is that specific reforms that restructure the arrangement of schooling—its inputs and our fundamental assumptions about the operational model of schools—can meaningfully move the needle in student outcomes, even if we don't change the fundamental incentives around those outcomes. This is an important thing to remember, because through innovation zones and the like, we can give individual localities the power to make changes to the resources and processes underlying schools, even if they can't change the system's priorities and incentives themselves. Would it be better if we changed the underlying incentives, priorities, and value proposition of schooling itself? You bet. in my estimation, but there's much we can and should be doing in the interim. Freeing up the inputs on the ground to allow educators more autonomy, educating them about what changes in the arrangement of schooling have proved helpful, and holding student outcomes dear can make an important and positive difference.

—Michael Horn, cofounder and distinguished fellow,
Clayton Christensen Institute for Disruptive Innovation

The imagery of education as an ecosystem resonates as we think about the future of education and what it could be. A true learning ecosystem would reflect a more unifying approach when crafting pre-K–12 education policy, adapt more quickly to best educational practices and emerging technologies, be shaped by learners' experiences, and foster agency among learners in meeting their goals and aspirations. While some of these elements surfaced as a result of *A Nation at Risk*, our continued insistence on traditional learning approaches, limitations in scaling innovative assessment practices, and political polarization in an area that was once unifying preclude us from scaling the innovations we know are successful and that all learners are due.

The adage "when you know better, do better" should drive education policy considerations. A continued focus on what works in education—with a greater emphasis on personalized competency-based learning experiences in which learners are immersed in real-world learning—is the most promising educational initiative underway. Many states are looking at how best to reimagine assessment and accreditation practices toward a more learner-centered approach that

is meaningful to students, teachers, parents, schools, and communities. Successful districts and state agencies have worked collaboratively with their communities and policymakers in building upon many of the successes that came about as a result of *A Nation at Risk*, envisioning a future of learning that moves us closer to creating the learning ecosystem we all desire.

—Dr. M. Jeremy Tucker, superintendent, Liberty Public Schools, Missouri

REFERENCES

Abdulkadiroğlu, Atila, Weiwei Hu, and Parag A. Pathak. 2013. "Small High Schools and Student Achievement: Lottery-Based Evidence from New York City." National Bureau of Economic Research, NBER Working Paper No. 19576.

Alfaro, P., D. K. Evans, and P. Holland. 2015. "Extending the School Day in Latin America and the Caribbean." Policy Research Working Paper; No. 7309. World Bank, Washington, DC. http://hdl.handle.net/10986/22183.

Angrist, Joshua D., and Victor Lavy. 1999. "Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement." *Quarterly Journal of Economics* 114, no. 2:533–75. http://www.jstor.org/stable/2587016.

Barrow, Lisa, Amy Claessens, and Diane Whitmore Schanzenbach. 2013. "The Impact of Chicago's Small High School Initiative." National Bureau of Economic Research, NBER Working Paper No. 18889.

Battistin, E., and E. C. Meroni. 2016. "Should We Increase Instruction Time in Low Achieving Schools? Evidence from Southern Italy." *Economics of Education Review* 55:39–56.

Bellei, Cristián. 2009. "Does Lengthening the School Day Increase Students' Academic Achievement? Results from a Natural Experiment in Chile." *Economics of Education Review* 28, no. 5:629–40.

Bergman, Peter. 2021. "Parent-Child Information Frictions and Human Capital Investment: Evidence from a Field Experiment. *Journal of Political Economy* 129, no. 1:199–222.

Bergman, Peter, and Isaac McFarlin Jr. 2020. "Education for All: A Nationwide Audit Study of School Choice." National Bureau of Economic Research, NBER Working Paper No. 25396.

Bergstein, Betsy. 2003. "Stronger, Smaller High Schools to Help Thousands of Oregon Students." Gates Foundation Press Release. https://www.gatesfoundation.org/ideas/media-center/press-releases/2003/04/oregon-small-schools-initiative.

Bettinger, Eric, Nina Cunha, Guilherme Lichand, and Ricardo Madeira. 2020. "When the Effects of Informational Interventions Are Driven by Salience—Evidence from School Parents in Brazil." August 2020. Last revised January 24, 2022. Available via SSRN. http://dx.doi.org/10.2139/ssrn.3644124.

Bettinger, Eric, and Bridget Long. 2018. "Mass Instruction or Higher Learning? The Impact of College Class Size on Student Retention and Graduation." *Education Finance and Policy* 13, no. 1:97–118.

Bivens, Josh, and Jori Kandra. 2022. "CEO Pay Has Skyrocketed 1,460% Since 1978: CEOs Were Paid 399 Times as Much as a Typical Worker in 2021." Economic Policy Institute, October 4. https://www.epi.org/publication/ceo-pay-in-2021.

Bloom, Howard, Saskia-Levy Thompson, and Rebecca Unterman. 2010. "Transforming the High School Experience: How New York City's New Small Schools Are Boosting Student Achievement and Graduation Rates." MDRC, June 2010.

Chingos, Matthew M., Katherine M. Lindquist, and Grover J. "Russ" Whitehurst. 2014. "School Superintendents: Vital or Irrelevant?" Brookings Institution, September. https://www.brookings.edu/articles/school-superintendents-vital-or-irrelevant.

Crain, Robert L., Anna Allen, Judith Warren Little, Debora Sullivan, Robert Thaler, Denise Quigley, and Gail Zellman. 1998. "The Effects of Career Magnet Schools." Institute on Education and the Economy; Brief No. 22, December. https://www.tc.columbia.edu/centers/iee/BRIEFS/Brief22.pdf.

Diament, Michelle. 2022. "Across US, Special Education Enrollment on the Rise." *Disability Scoop*, June 24, 2022. https://www.disabilityscoop.com/2022/06/24/across-us-special-education-enrollment-on-the-rise/29920.

Dobbie, Will, and Roland G. Fryer. 2013. "Getting beneath the Veil of Effective Schools: Evidence from New York City." *American Economic Journal: Applied Economics* 5, no. 4: 28–60.

Farbman, David A. 2015. "The Case for Improving and Expanding Time in School: A Review of Key Research and Practice." Updated and revised February 2015. https://www.timeandlearning.org/sites/default/files/resources/caseformorelearningtime.pdf.

Fryer, R., and W. Dobbie. 2011. "Are High-Quality Schools Enough to Increase Achievement among the Poor? Evidence from the Harlem Children's Zone." *American Economic Journal: Applied Economics* 3, no. 3: 158–87.

Gamoran, A. 1996. "Student Achievement in Public Magnet, Public Comprehensive, and Private City High Schools." *Educational Evaluation and Policy Analysis* 18, no. 1: 1–18.

Gates, Bill. Annual Letter 2009. https://www.gatesfoundation.org/ideas/annual-letters/annual-letter-2009.

Gill, B., R. Zimmer, J. B. Christman, and S. Blanc. 2007. "State Takeover, School Restructuring, Private Management, and Student Achievement in Philadelphia." Santa Monica, CA: RAND Corporation.

Griffith, Michael. 2008. "State Funding Programs for High-Cost Special Education Students." Education Commission of the States: State Notes, May 2008. https://www.ecs.org/clearinghouse/78/10/7810.pdf.

Grissom, Jason A., and Hajime Mitani. 2016. "Salary, Performance, and Superintendent Turnover." *Educational Administration Quarterly* 52, no. 3: 351–91. https://doi.org/10.1177/0013161x15627677.

Hanushek, Eric A. 1986. "The Economics of Schooling: Production and Efficiency in Public Schools." *Journal of Economic Literature* 24, no. 3:1141–77.

———. 1999. "The Evidence on Class Size." In *Earning and Learning: How Schools Matter*, 131–68. Edited by Susan E. Mayer and Paul E. Peterson. Washington, DC: Brookings Institution.

Hart, Walter H., Megan Schramm-Possinger, and Sherry Hoyle. 2019. "Superintendent Longevity and Student Achievement in North Carolina Public Schools." Editorial Review Board, 2019.

Hoxby, Caroline M. 2000. "The Effects of Class Size on Student Achievement: New Evidence from Population Variation." *Quarterly Journal of Economics* 115, no. 4: 1239–85. http://www.jstor.org/stable/2586924.

Huebener, M., A. Kuger, and J. Marcus. 2017. "Increased Instruction Hours and the Widening Gap in Student Performance." *Labour Economics* 47: 15–34. https://doi.org/10.1016/j.labeco.2017.04.007.

Iyengar, Nithin, Kate Lewis-LaMonica, and Mike Perigo. 2017. "School District Innovation Zones: A New Wave of District-Led Efforts to Improve Economic Mobility." Bridgespan Group, October 2017. https://www.bridgespan.org/getmedia/cf61a0c2-0519-49be-878d-7bd055a1d8ab/school-district-innovation-zones-a-new-wave-of-district-led-efforts-to-improve-economic-mobility.pdf.

Jones, F., and A. Chambers. 2021. "Innovation Zones: Policy Flexibility to Reimagine and Modernize K–12 Education Post-COVID-19." Vienna, VA: Aurora Institute Issue Brief, June 2021.

Kemple, J. J., and J. C. Snipes. 2020. "Career Academies: Impact on Students' Engagement and Performance in High School." New York: MDRC, March 2000. https://www.mdrc.org/sites/default/files/Career_Academies_Impacts_on_Students.pdf.

Kolodner, Meridith. 2015. "Once Sold as the Solution, Small High Schools Are Now on the Back Burner." *Hechinger Report*, September 29, 2015. https://hechingerreport.org/once-sold-as-the-solution-small-high-schools-are-now-on-the-back-burner.

Krueger, Alan B. 2003. "Economic Considerations and Class Size." *Economic Journal* 113, no. 485: F34–63. http://www.jstor.org/stable/3590138.

Lavy, Victor. 2012. "Expanding School Resources and Increasing Time on Task: Effects of a Policy Experiment in Israel on Student Academic Achievement and Behavior." Working Paper No. w18369. Cambridge, MA: National Bureau of Economic Research.

Lazear, Edward. 1999. "Educational Production." Working Paper No. 7349. Cambridge, MA: National Bureau of Economic Research.

Lichand, Guilherme, Eric Bettinger, Nina Cunha, and Ricardo Madeira. 2020. "The Psychological Effects of Poverty on Investments in Children's Human Capital." University of Zurich, Department of Economics, Working Paper No. 349, July 16, 2020. Last revised April 27, 2021. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3633815.

Macdonald, Mott, and Muriel Dunbar. 2015. "Secondary Vocational Education: International Experience." World Bank Group, Final Report, April 2015. https://documents1.worldbank.org/curated/en/470241468000264353/pdf/103893-WP-P145371-PUBLIC-Vocational-Education-Report-Final.pdf.

McCord, Robert S., and Leslie A. Finnan. 2019. "AASA Superintendent Salary & Benefits Study: Non-Member Version." ERIC, January 1, 2019, https://eric.ed.gov/?id=ED619865.

Mishel, Lawrence, and Richard Rothstein. 2002. *The Class Size Debate*. Washington, DC: Economic Policy Institute, 2002.

Mosteller, Frederick. 1995. "The Tennessee Study of Class Size in the Early School Grades." *Future of Children* 5, no. 2: 113–27. https://doi.org/10.2307/1602360.

National Center on Time and Learning. 2017. "History of Expanded Learning Time." https://timeandlearning.org/about/history.

NCEE (National Commission on Excellence in Education). 1983. *A Nation at Risk: The Imperative for Educational Reform*. Washington, DC: US Department of Education.

O'Donnell, Patrick. 2012. "Former Cleveland Schools CEO Barbara Byrd-Bennett Becomes CEO of Chicago Public Schools." *Plain Dealer*, October 12, 2012. https://www.cleveland.com/metro/2012/10/former_cleveland_schools_ceo_b_1.html.

Ravitch, Diane. 2008. "Bill Gates and His Silver Bullett." *Forbes*, November 19, 2008. https://www.forbes.com/2008/11/18/gates-foundation-schools-oped-cx_dr_1119ravitch.html?sh=79b3c7f44410.

Rosa, Leonardo, Eric Bettinger, Martin Carnoy, and Pedro Dantas. 2022. "The Effects of Public High School Subsidies on Student Test Scores: The Case of a Full-Day High School in Pernambuco, Brazil." *Economics of Education Review* 87: 102201. https://doi.org/10.1016/j.econedurev.2021.102201.

Ruble, W. 2015. "The Effect of Contracting Out Low Performing Schools on Student Performance." Working Papers 1521, Tulane University, Department of Economics. https://ideas.repec.org/p/tul/wpaper/1521.html.

Schanzenbach, Diane Whitmore. 2014. "Does Class Size Matter?" National Education Policy Center, 2014. http://www.jstor.org/stable/resrep42079.

Schwartz, Amy E., L. Stiefel, and Matthew Wiswall. 2013. "Do Small Schools Improve Performance in a Large, Urban District? Causal Evidence from New York City." *Journal of Urban Economics* 77: 27–40.

Sims, David P. 2008. "A Strategic Response to Class Size Reduction: Combination Classes and Student Achievement in California." *Journal of Policy Analysis and Management* 27: 457–78.

Skoufias, Emmanuel. 2001. "Progresa and Its Impacts on the Human Capital and Welfare of Children and Adults in Rural Mexico: A Synthesis of the Results of an Evaluation by IFPRI." Washington, DC: International Food Policy Research Institute, 2001.

Stiefel, L., A. E. Schwartz, and M. Wiswall. 2015. "Does Small High School Reform Lift Urban Districts? Evidence from New York City. " *Educational Researcher* 44, no. 3: 161–72. https://doi.org/10.3102/0013189X15579187.

Toch, Thomas. 2010. "Small Is Still Beautiful." *Washington Monthly*, July/August 2010.

US Department of Education. 2020. Digest of Educational Statistics (Particularly Tables 228.70 and 228.20).

Waldrip, Donald. 2023. "A Brief History of Magnet Schools." https://magnet.edu/brief-history-of-magnets.

Wang, Jia, Joan L. Herman, and Daniel Dockterman. 2018. "A Research Synthesis of Magnet School Effect on Student Outcomes: Beyond Descriptive Studies. *Journal of School Choice* 12, no. 2: 157–80. https://doi.org/10.1080/15582159.2018.1440100.

York, Benjamin N., and Susanna Loeb. 2014. "One Step at a Time: The Effects of an Early Literacy Text Messaging Program for Parents of Preschoolers." NBER Working Paper; No. 20659. November 2014. Revised March 2018. https://www.nber.org/papers/w20659.

Zablotsky Benjamin, Lindsey I. Black, Matthew J. Maenner, Laura A. Schieve, Melissa L. Danielson, Rebecca H. Bitsko, Stephen J. Blumberg, Michael D. Kogan, and Coleen A. Boyle. 2019. "Prevalence and Trends of Developmental Disabilities among Children in the United States: 2009–2017." *Pediatrics* 144, no. 4: e20190811.

Zimmer, R., G.T. Henry, and A. Kho. 2017. "The Effects of School Turnaround in Tennessee's Achievement School District and Innovation Zones." *Educational Evaluation and Policy Analysis* 39, no. 4: 670–96. https://doi.org/10.3102/0162373717705729.

NOTES

1. Byrd-Bennett later pled guilty to kickback payments on textbook contracts.

2. While not all innovation zones were started as a means of creating school turnaround, many districts turn to innovation zones as a means of facilitating school turnaround.

3. See, for example, California's requirement for Comprehensive School Safety Plans at California Department of Education, "Comprehensive School Safety Plans," last reviewed Friday, August 19, 2022, https://www.cde.ca.gov/ls/ss/vp/cssp.asp.

28 27 26 25 24 23 7 6 5 4 3 2 1

ABOUT THE AUTHOR

ERIC BETTINGER

Eric Bettinger is a senior fellow at the Hoover Institution and the Conley-DeAngelis Family Professor in the School of Education at Stanford University. He is a research associate at the National Bureau of Economic Research. His research interests include the economics of education; student success in college; and the effects of school choice on both academic and nonacademic outcomes.

A Nation at Risk + 40

The modern school-reform movement in the United States was set in motion by the release of the report *A Nation at Risk* in 1983. Countless education policy changes at the local, state, and national levels came as a result. *A Nation at Risk + 40* is a research initiative designed to better understand the impact of these efforts. Each author in this series has gone deep in a key area of school reform, exploring the following questions: *What kinds of reforms have been attempted and why? What is the evidence of their impact? What are the lessons for today's education policymakers?* As the nation's schools work to recover from the effects of the COVID-19 pandemic, this series not only describes the education-reform journey of the past forty years, it also provides timely and research-driven guidance for the future.

The Hoover Institution gratefully acknowledges Allan B. and Kathy Hubbard, the Daniels Fund, the William and Flora Hewlett Foundation, and the Koret Foundation for their generous support of the Hoover Education Success Initiative and this publication.

Hoover Institution, Stanford University
434 Galvez Mall
Stanford, CA 94305-6003
650-723-1754

Hoover Institution in Washington
1399 New York Avenue NW, Suite 500
Washington, DC 20005
202-760-3200

HOOVER INSTITUTION