



Transforming the Education Sector into a Learning System

Perspectives from the Field and
Recommendations for Action

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Executive Summary

Every day, educators, advocates, and families strive to ensure that our schools prepare all students to excel academically and thrive in life. To realize that ambitious goal, we must ensure that our education sector functions at all levels as a learning system. Too often, though, a culture of compliance and a desire to preserve the status quo take precedence over innovation and improvement, slowing the pace of progress.

In a February 2019 paper, [*Transforming the Education Sector into a Learning System: Harnessing the Power of Continuous Improvement, Research & Development, and Data to Improve Outcomes for Each and Every Child*](#), EducationCounsel presented a vision and framework for a robust learning system in education. Achieving this vision requires both a culture of continuous learning and several key system components, including robust research and development (R&D), continuous improvement, and data infrastructures. Further, working across all these components are four key drivers of a learning system — human capacity, resources, leadership, and policy and incentives — that must be aligned to the learning system vision.

The good news is that we are not starting from scratch. There are existing bright spots and exciting trends toward a learning system approach. But transforming the education sector into a learning system will require broad and deep change. This paper — the result of a collaboration between EducationCounsel and Carnegie Corporation of New York — picks up where our earlier paper left off by grappling with the critical question of how to accelerate the shift from the system we have to the learning system we need.

Before jumping into action, though, it is critical to understand the existing system, how it operates, and how it might be transformed. To that end, with this paper, we look to clarify seven of the key challenges that must be overcome to develop a stronger learning culture and build a more robust and interconnected learning infrastructure.

Although these challenges are significant, there are several actions that can be taken now to meaningfully advance our vision of the education sector as a learning system. Drawing on a review of relevant literature, interviews with leaders at all levels of the system, and a series of convenings, we also offer six recommendations for early action.

In doing so, we aim to illustrate what is possible and to inspire both concrete action and additional innovation. Some of our recommendations reflect new efforts, while others would accelerate and expand efforts already underway. Together, they illustrate what it will take to achieve our ambitious vision. It will be a long, complicated, and utterly essential journey.

Introduction

The history of human progress is defined by our ability to work together, accumulate knowledge and skills, and build upon what came before. Today, sectors that have developed systems and cultures focused on using data, evidence, experience, and judgment to continuously innovate and improve — individually and collectively — have experienced ongoing progress and, periodically, breakthrough successes. But ironically, the structures and culture in the education sector do not generally support such learning. Instead, they tend to operate with a compliance mindset that hinders innovation and improvement.

In [*Transforming the Education Sector into a Learning System: Harnessing the Power of Continuous Improvement, Research & Development, and Data to Improve Outcomes for Each and Every Child* \(Gordon et al. 2019\)](#), EducationCounsel presented a vision and framework for what our education system needs to function as a learning system and achieve equity and excellence for every student. The shift toward functioning as a learning system must take place at all levels — from schools and classrooms to districts, states, and even the federal government. It must take place in research institutions, philanthropic foundations, and educator preparation programs. This transformation will require much greater attention to building a culture of continuous learning, as well as key system components, including a research and development (R&D) infrastructure, a data infrastructure, and a continuous improvement infrastructure.

Our earlier paper drew on research, lessons learned from other sectors, and leading efforts in education in order to articulate why we need a learning system and what a learning system looks like in terms of both culture and structure. It also began to approach the question of how to make the shift from our current system to a learning system, from federal grant-making down to the level of teaching and learning. But though it described how a learning system might manifest at each level of the system and flagged some initial strategies to consider, it only scratched the surface of the transformation process.

EducationCounsel and Carnegie Corporation of New York are now picking up where that paper left off to more fully explore how to foster a learning system in education. Our aim is not to present a single, comprehensive roadmap for change. Rather, we aim to examine the gaps between the system we have and the system we need and recommend early actions that would help close these gaps. Our six recommendations, which span different levels of the education system, are ripe for action and likely to meaningfully advance our vision. To that end:

- **In Section 1**, we summarize the key components of a learning system set forth in *Transforming the Education Sector into a Learning System*.
- **In Section 2**, we synthesize the experience and perspectives of a wide array of education leaders to examine gaps between the education system we have and the learning system we need and to articulate the key challenges we face.

- **In Section 3**, we focus briefly on the topic of systems change and what it might take to move any significant change through our complex, fractured, deeply human education system. While there is no single theory that must govern change efforts, an understanding of systems change is critical to realizing our vision — which concerns fundamental changes to the education system.
- **In Section 4**, we offer recommendations for action that emerged from our research and convenings. Our primary purpose is to illustrate what is possible and to inspire both concrete action and the further generation of ideas. While realizing our ambitious vision for education will be a long and complex project, these near-term steps should move us in the right direction. Some recommendations reflect new efforts, while others would accelerate and expand efforts already underway.

Our analysis and recommendations draw on a review of publicly available reports and scholarly articles, as well as interviews with over 60 leaders in the field, including school, district, state, and federal education leaders; academic researchers; funders; and tool, technology, and professional development providers. They are also informed by a March 2019 convening of leaders in the field to discuss how we can advance a learning system approach. In developing our analysis and recommendations, we were heavily influenced by the work and collaborative thinking of convening participants, who represented all corners of the education ecosystem. Throughout this paper, we provide examples of their efforts, which are already showing powerful avenues for moving toward a learning system.

Advancing a learning system approach is particularly crucial at this moment of increased expectations for student success, persistent and corrosive disparities in opportunities and student outcomes, and devolution of authority from the federal government to states and districts under the Every Student Succeeds Act (ESSA). There is also increasing interest in a learning system approach from a variety of stakeholders, from Congress (e.g., ESSA's evidence and continuous improvement provisions and the more recent Foundations for Evidence-Based Policymaking Act of 2018) to practitioners (e.g., the Carnegie Foundation for Advancement of Teaching's improvement [networks](#)) to research institutions (e.g., University of Colorado Boulder's [Center for Assessment, Design, Research, and Evaluation](#)) to philanthropic organizations (e.g., the Bill & Melinda Gates Foundation's [new investments](#) in networks for school improvement).

Education is a complex and highly fragmented ecosystem. The challenges of shifting from a compliance orientation to a learning culture are similarly complex; they defy simple solutions. The recommendations in this paper begin to show what is possible by identifying high-leverage opportunities to make a difference, but they are not exhaustive. What is more, there will always be new challenges, and innovative ideas for overcoming them will only emerge if we all become part of a learning culture.

Section 1

Background: A Vision for an Education Learning System

In *Transforming the Education Sector into a Learning System*, we presented a framework for the structural and cultural components that must be in place for education to function as a learning system at every level. The framework places students at the center and aligns around shared goals for them — for example, preparing all students with the full range of knowledge, skills, and mindsets needed to achieve their full potential. The framework then articulates three interrelated, mutually dependent infrastructures or components of an education learning system (each of which has several essential elements, enumerated below):

1. **An R&D infrastructure** enables the generation and evaluation of insights, evidence, tools, programs, policies, and practices to inform and support teaching and learning. A strong R&D infrastructure allows all stakeholders to surface issues and anomalies in the field; prioritize and coordinate research efforts; generate various forms of research evidence; develop innovative, research-based tools and strategies; support the ongoing translation and dissemination of research to the field; and engage with and empower professionals across the system.
2. **A continuous improvement infrastructure** supports ongoing, collaborative efforts in policy and practice to implement, refine, and provide feedback on solutions generated by R&D and practitioner-led innovation. This component of the learning system includes, at all levels, built-in mechanisms that advance research-based, data-informed actions; guide reasoned adaptations of those actions to suit particular contexts; and feed further research, development, and scaling of promising approaches.
3. **A data infrastructure** makes it possible for every person with a stake in education to have the timely and tailored information needed to make the best decisions possible in their role and circumstance. An effective data infrastructure enables the collection, linkage, and protection of the data required to answer end users' questions while safeguarding individuals' privacy. In addition, it promotes transparency as to how the system is serving students.

Ultimately, we need the kind of culture in education where continuous improvement is simply part of the way business is done. Structures and processes can be designed to promote a learning-oriented culture that in turn reinforces and sustains those structures and processes in a virtuous cycle. But a learning-oriented culture cannot be created without direct and early efforts to build understanding and trust among people in the system. Without shifting mindsets and behavior, improvement efforts will fail to take hold.



ELEMENTS OF AN R&D INFRASTRUCTURE

- **Identification, prioritization, and coordination:** Researchers and developers work with each other and with practitioners and policymakers to identify critical research questions. Research is coordinated to maximize the overall impact of independently operated research initiatives, avoid duplication, promote replication, and achieve key insights in a timely manner.
- **Research:** Various forms of research are conducted to meet specific needs, build bodies of rigorous and relevant evidence, and provide the full array of insights needed to evaluate and develop educational tools and techniques. Necessary types of research include needs analyses, basic research, field scans, applied/effectiveness research, implementation research (operational/contextual research), improvement research (continuous improvement), and R&D system meta-research.
- **Development:** Designers and engineers create effective tools, strategies, and products based on strong research that also shows whether they work for different learners in different contexts and that can help leverage and scale the application and adoption of effective practices.
- **Aggregation, commercialization, and engagement:** Mechanisms and structures exist for stakeholders to sift through research to surface trends, identify the most actionable findings, and determine how they might be applied to inform development, policy, and practice. Coalitions work together to define, conduct, analyze, and implement R&D, and there is a deep and sustained focus on building connections between individuals to support meaningful engagement among researchers, developers, practitioners, and policymakers.



ELEMENTS OF A CONTINUOUS IMPROVEMENT INFRASTRUCTURE

- **Organizational design:** Educational organizations (e.g., school districts or individual schools) are designed in alignment with a learning system vision, including the structures, processes, capacity, and resources needed for teams and individuals to prioritize and support continuous improvement.
- **Continuous improvement methodologies:** Both formal and informal continuous improvement methodologies are embedded within organizational and individual routines to guide learning and improvement efforts. Professionals at all levels of the system regularly engage in processes of innovation, adaptation, implementation, evaluation, and review.
- **Collaborating communities:** Informed, facilitated collaboration among internal and external stakeholders is valued and prioritized for its ability to advance and accelerate learning beyond what is possible on an individual basis.



ELEMENTS OF A DATA INFRASTRUCTURE

- **Data systems:** Stakeholders throughout the system have timely access to stable, interoperable longitudinal data systems. These systems continuously and accurately collect, aggregate, and disaggregate large data sets that include formative and summative data and critical information about contexts that might impact the data (i.e., system variation). System variation data includes both characteristics of situations that impact the effectiveness of interventions and individuating characteristics of students that impact the appropriateness of interventions for them. Further, data systems are appropriate to the given level of the education system and constructed to evolve as data needs change and new data becomes available.
- **Reporting:** Data is packaged and visualized in user-friendly, accessible, and actionable ways. Stakeholders at all levels have access to user-informed, customizable dashboards that show areas for improvement and progress toward goals and that provide insights about the effectiveness of interventions.
- **Privacy and security:** Personally identifiable data is protected and stored securely based on clear rules, procedures, and mechanisms that allow access to the right parties for the right purposes. Those entrusted with managing data systems communicate transparently with stakeholders about the data they collect, the purpose of the collection, to whom they grant access, and the intended and actual uses of the data.
- **Interoperability:** Key data across systems and sectors that serve students is linked to ensure that data follows individuals (aided by individual student identifiers) and can be appropriately shared to foster alignment at the systems level and support for students as they progress — particularly during transitions in their childhood development, education, and entrance into the workforce. Such data comes from a range of sources, including early childhood, K–12, postsecondary, workforce, and child welfare data systems.



KEY DRIVERS OF CHANGE

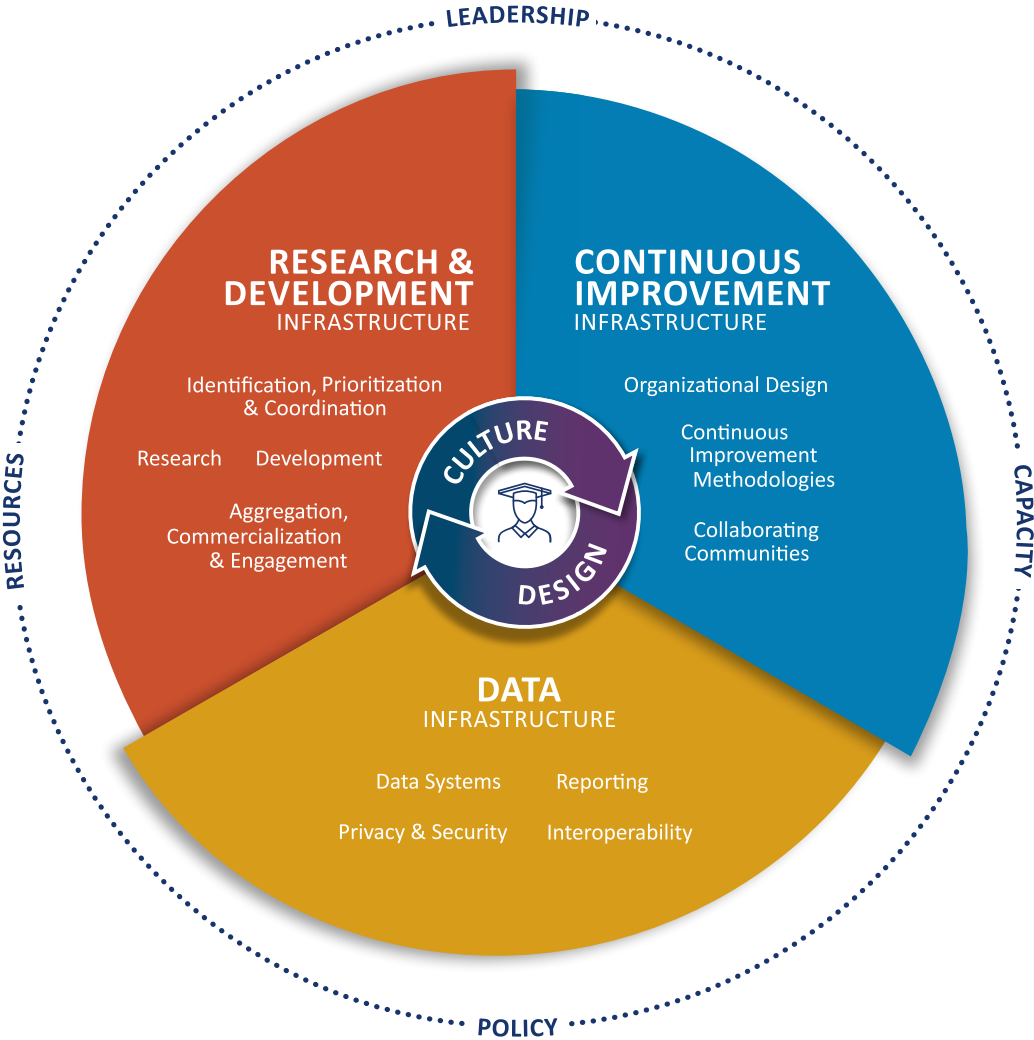
Each of the three components of a learning system — R&D, continuous improvement, and data — can be powered by four key drivers of change:

- **human capacity**, with the skills, knowledge, and mindsets to facilitate and engage in improvement efforts;
- sufficient and sustained **resources** to build and strengthen the learning system over time;
- the **leadership** required to establish a vision of a learning system and execute on it; and

- the right mix of **policies and incentives** to remove barriers and empower people at all levels to embrace a learning orientation.

Taken together, the three components and four drivers comprise a comprehensive vision for a learning system in education — one that is needed in and across each level of the education system. Their interrelationship is illustrated in Figure 1.

Figure 1: Education Learning System



Section 2

Challenges

Any consideration of how we advance toward a learning system approach must begin with an attempt to better understand the existing system and how it operates. In this section, we highlight seven challenges or gaps in the current system that emerged as prominent themes in our research and interviews.

While some of the challenges we identified are structural, others are cultural. Overcoming the latter will require sustained leadership and vision to change existing norms and values. Interviewees frequently remarked on the need to shift from a compliance mentality toward an inquiry stance and to build the trust required for innovation, improvement, and learning.

Another theme cutting across the challenges described here (and our recommendations for early action) relates to the inequitable structures and processes built into the current system. The status quo often perpetuates rather than challenges — much less dismantles — inequities through policies, practices, and mindsets that privilege some and oppress others. Equity challenges exist wherever questions of who wields power arise: What research questions are being studied? Which communities benefit from existing approaches to R&D? Are efforts to continuously improve existing processes crowding out efforts to point out systemic inequities? How are data systems being used to reinforce historical oppression? Any effort to develop a learning system must advance equity by addressing structural racism and other forms of discrimination head on.

The challenges described below are illustrative of the variety of complex challenges that must be overcome as we work toward a shared vision of a learning system. We unpack each challenge by summarizing our research and sharing observations from leaders from across the education system.

CONTINUOUS IMPROVEMENT INFRASTRUCTURE

CHALLENGE 1: Organizational culture and incentives do not support continuous learning and improvement.

CHALLENGE 2: The structures and conditions needed to support continuous learning are not adequately developed.

R&D INFRASTRUCTURE

CHALLENGE 3: Funding for R&D in education is low, especially on the development side.

CHALLENGE 4: Approaches to knowledge creation are not tailored to policy and practice needs.

CHALLENGE 5: The field lacks commonly agreed-upon evidence standards and a common vocabulary.

CHALLENGE 6: Approaches to diffusing knowledge do not reflect how stakeholders acquire and use information.

DATA INFRASTRUCTURE

CHALLENGE 7: The culture of data use needs to be strengthened, and concerns about data privacy and security need to be addressed.



CONTINUOUS IMPROVEMENT INFRASTRUCTURE

Challenge 1: Organizational culture and incentives do not support continuous learning and improvement.

For the education sector to become a learning system, we must cultivate trust and a learning mindset among all stakeholders. The process starts with leaders and governing bodies, which set the vision, incentives, and priorities for a system. However, many of those we interviewed noted that the focus on test-based accountability has inadvertently narrowed stakeholders' attention to test scores, as opposed to other measures of learning (O'Day and Smith 2016).

"We don't have a culture in education that is focused on continuous improvement," said Aimee Rogstad Guidera, a strategic consultant who formerly led the Data Quality Campaign. "We're such a compliance- and accountability-driven culture; we're all hammer and no flashlight." This compliance-based mentality, driven by federal and state laws and resultant approaches to monitoring and auditing, works against a culture focused on inquiry and innovation. It also has reduced levels of trust throughout the system, created short timelines for showing improvement, and promoted a tendency among some practitioners to play it safe

rather than working to learn and innovate. According to those we interviewed, high turnover in leadership and the often vicious political nature of education decision-making in the United States also discourage people from sharing failures and challenges.

“I’m not sure the incentives line up for continuous improvement or evidence-based decision-making for many of the actors,” said John King, Jr., former U.S. secretary of education and president of the Education Trust. “If the leader doesn’t have that incentive, that trickles down to the district office team and the principals. And, certainly, we’ve seen under No Child Left Behind a phenomenon that looks a lot like the overreliance on quarterly earnings in the private sector, with decision-making around small movements in annual test scores defining success, when we know it’s not a very smart way of doing long-term planning.”

For a learning system to take hold, the emphasis needs to be less on control and regulation and more on the creation of structures that enable practitioners to learn from one another, develop new ideas, and spread those ideas across institutions. Such a system needs an assessment and accountability structure more consistent with a focus on improving ongoing processes (Mehta et al. 2012).

A survey of school and district leaders by the National Center for Research in Policy and Practice found that the majority of respondents disagreed with the statement that people expected claims made in meetings to be backed up by research. Just over half agreed that “We conduct studies on programs we select and implement to see how they work” (Penuel et al. 2016). District leaders set the tone: The study found a strong correlation between leaders’ level of research use and their endorsement of statements about the culture of evidence in their department or district. Many of the leaders who reported using research often also said their districts regularly evaluate their own initiatives (Penuel et al. 2016).

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Several interviewees pointed to deeply rooted cultural barriers to creating a learning system in education. For example, Ross Wiener, director of the Aspen Education and Society Program, observed, “The way we’ve structured it conceptually [is that] as a leader, you’re supposed to know everything you need to know, and you’re the source of information, rather than being a learner in the system. That’s just a profound challenge in our space.”

Thomas Kane, a professor at the Harvard Graduate School of Education, referred to an argument made by psychologist Daniel Kahneman, author of *Thinking, Fast and Slow*, that experts are typically overconfident in their predictions about efficacy. In education, where it has been difficult to test the efficacy of interventions, Kane said, “When a district leader has a hunch about how to improve student outcomes, they typically implement without testing because they are so confident in their own professional judgment. However, if they were to pause and test those hunches on a small scale first, with a comparison group, they would learn what the pharmaceutical field and the retail industry learned a long time ago: Most ideas that sound good on paper don’t work, and to make progress, we need to pilot more ideas and to broadly implement only the small subset that actually work.”

In contrast, Kaya Henderson described the inquiry stance she brought to her work when she was chancellor of D.C. Public Schools: “Everything was up for conversation for me; there were no sacred cows. I think part of the reason why we’re not learning organizations is because we’re so busy being experts and digging in on things we’ve done, as opposed to being in a constant learning mode. All of my professional experience before I came to D.C. Public Schools, except for two years teaching, was in start-up organizations, where every single day you’re asking, ‘What’s working? What’s not? Let’s throw out what doesn’t work.’ So that was my professional orientation. The exact opposite is true of schools and school districts. The philosophy is to codify and solidify and entrench. So I think that there is a philosophical problem, which impedes people from being active learners.”

King pointed out that a learning stance was at the core of how charter schools were initially envisioned — as laboratories for innovation and continuous learning — and that some charter management organizations are doing promising work in this regard today: “Within individual networks — like Uncommon, KIPP, Achievement First — there’s a culture that looks more like Silicon Valley in terms of, ‘We have an idea; we test it; we evaluate it with data. If it works, we do more; if it doesn’t work, we stop.’ I think there is an appetite to do that more broadly, like the CORE districts in California. Imagine if more groups of superintendents or a group of state chiefs committed to that work. But funders need to support it.”

Attendees at EducationCounsel’s July 2017 convening on continuous improvement identified changing mindsets and building trust as critical to developing a learning culture. As described by Dan Gordon in *Convening on Continuous Improvement in Education: Summary of Key Points and Takeaways* (2017, p. 1), “They indicated the need to employ trust-building mechanisms and mindset-shifting activities early, often, and throughout the system.” These changes require leaders committed to a culture of teamwork, collaboration, and adaptability.

In a review of the literature on effective strategies to increase the use of research evidence, Jonathan Breckon and Jane Dodson of the Alliance for Useful Evidence write, “Ideally, we want to create a social or professional norm, where evidence-use is the right thing to do. So it’s the new normal.... And once you have those norms, it would be good to encourage people to stick to them, by creating nudges, identity cues and priming. For instance, reminding people that their professional identity is about being evidence-informed. To be a professional, you need to be on top of the research — and, you could say in your nudge, look at all your colleagues who feel the same way” (p. 8).

Several of our interviewees suggested that shifting educators’ mindsets and capacity to use research and evidence must start with teacher and leader preparation programs, where educators’ norms and skills are first developed. “If you think about other sectors, like medicine, it’s embedded in the way doctors are trained,” said Carmel Martin, former executive vice president for policy at the Center for American Progress. “They’re continually looking at what the evidence says about the best interventions, and then it goes on to be a part of their practice, and it becomes a constant feedback loop.” King said that most educator preparation programs “aren’t addressing evidence as a topic. That’s an academic discipline that ideally people would have experience within their training, and I don’t think that’s represented at all.” Preparation programs need to prepare teachers and education leaders to cultivate a culture of evidence use and encourage leaders to look for research when confronted with a new problem (Penuel and Gallagher 2017).

Challenge 2: The structures and conditions needed to support continuous learning are not adequately developed.

For education to become a learning system, we must create and support collaborative professional learning communities, both formal and informal, that can advance and accelerate learning beyond what is possible on an individual basis (Gordon et al. 2019). Yet current allocations of time, resources, and human capacity in U.S. schools do not support the prioritization of collaborative inquiry. Practitioners and policymakers have cited a lack of time or time pressures as challenges to seeking out and using research (Anderson and Goldstein 2015; DuMont 2015).

American teachers have little time for anything but teaching, noted Andreas Schleicher, the director for education and skills and special advisor on education policy at the Organisation for Economic Co-operation and Development. In contrast, teachers in Shanghai teach only 11 to 15 hours a week, with the remain-

ing time spent on professional learning communities, lesson study, research, and the sharing of effective practices. Similarly, school leaders in Finland spend two-thirds of their time working for their school and one-third working for the district to solve problems collectively with their colleagues. Other nations and jurisdictions, including Alberta and Ontario, Canada, and Singapore, similarly have set up mechanisms for teachers and school leaders to develop and share knowledge. In these systems, research and inquiry are part of educators' professional responsibilities. Researchers and educators in these places are often more connected in investigating improvements in practice. In Alberta, Canada, more than 90 percent of schools are continuously engaged in school-designed innovations that involve inquiry (Hargreaves and Fullan, 2012).

“An improvement approach is at the core of every high-performing system around the world.”

— Ben Jensen, Learning First

“The best incentives,” said Schleicher, “are ones that focus on professional interest. You have to assume that when teachers are given the time and the space, they like to collaborate. It’s more a matter of finding the leadership in the schools that brings teachers together. Teacher professional collaboration also is one of the biggest drivers of job satisfaction and professional efficacy.”

A 2016 study of professional learning in four high-performing systems — Shanghai, Hong Kong, Singapore, and British Columbia — by Ben Jensen and his colleagues at Learning First showed that in these systems, all professional learning was connected with an improvement cycle in schools focused on student learning, with strong linkages to the structure of leadership roles, the allocation of resources, and the focus of evaluation and accountability measures. “High-performing systems transform the improvement cycle into a culture of continuous professional learning,” the study found, “that, in time, turns schools into true learning organizations” (p. 4).

“I think the improvement approach is at the core of every high-performing system around the world,” Jensen said in an interview. “I don’t know of many districts or states that take on that model. I don’t think systems in the United States are good at saying, ‘Here’s how we improve and learn.’”

Historically, state education agencies have focused more on compliance than capacity building. Interviewees cited significant capacity challenges within state education agencies to support collaborative improvement, particularly given their increasing decision-making authority under ESSA. As Linda Darling-Hammond, a professor of education emeritus at Stanford University, noted, the elimination of Title V from the Elementary and Secondary Education Act in the early 1980s severely reduced money for state education agencies to develop their technical assistance and research divisions. “What you ended up losing was the professional management system in states,” she said. “The few states that have continued to reliably and consistently perform well are the ones [such as Massachusetts and Kentucky] that have stronger capacity to do that work.”

Lillian Lowery, a former district and state superintendent, suggested that given limited capacity, state education agencies are better positioned to be repositories and purveyors of knowledge than producers of new knowledge. “I do think that the school is the agent of change,” she said. “But with ESSA devolving the accountability and reporting around outcomes for all the schools in a state, I think state education agencies are a pivot point.”



R&D INFRASTRUCTURE

Challenge 3: Funding for R&D in education is low, especially on the development side.

In terms of public money, R&D is significantly underfunded in education compared with other fields, such as medicine (Feuer 2016). Figure 2 illustrates how our federal investments in education R&D have for decades paled in comparison to defense and health R&D budgets. The two major federal agencies that invest in education research — the National Science Foundation and the Institute of Education Sciences — had budgets of roughly \$1.5 billion in the 2014 fiscal year, compared with more than \$30 billion for the National Institutes of Health (Penuel and Gallagher 2017).

Compared with other U.S. industries, the education sector currently spends less than a tenth of the average percentage of federal funding on R&D (Bill & Melinda Gates Foundation and Chan Zuckerberg Initiative 2018). There is also relatively little private-sector-funded R&D in education, driven in part by how hard it can be to convince education systems to adopt evidence-based approaches and promising new tools (see Challenge 6) as well as the many challenges associated

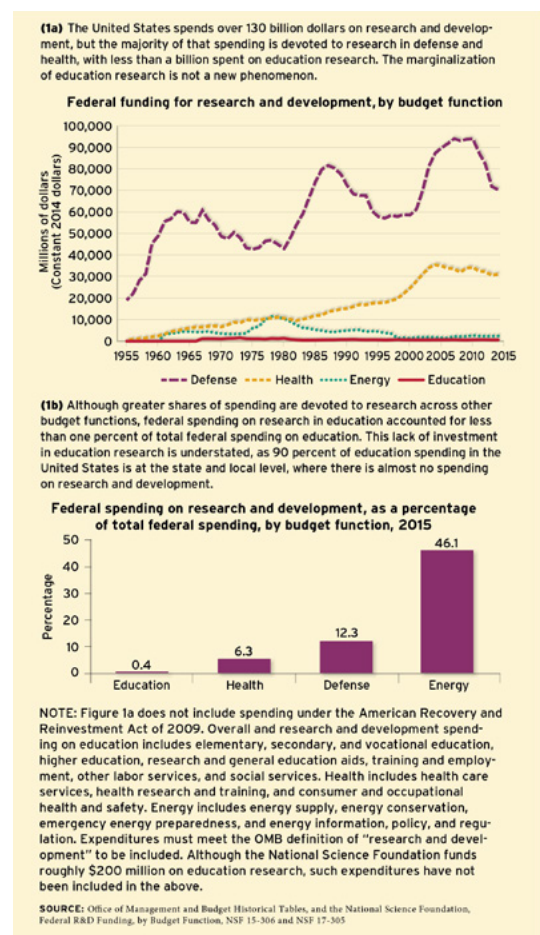


Figure 2

with state and local procurement systems. The low level of R&D investment has contributed to a lack of impact, particularly at scale, and an inconsistent flow of new knowledge between researchers and practitioners.

Because major structural changes to the supply side of the R&D infrastructure require big shifts in financial and political capital, the best bet for significant change may be on the demand side. Motivated leaders at the state, local, and institutional levels can reconsider how they use evidence and lead the call for actionable, contextualized research and products, tools, and strategies to connect that research to practice.

“One of the most astonishing aspects of education research, though, is how little the government actually spends for it, at least relative to the size of the national investment in education and relative to the amounts spent on other areas of research.”

— Michael J. Feuer (2016)

Challenge 4: Approaches to knowledge creation are not tailored to policy and practice needs.

As Vivien Tseng notes in [“The Uses of Research in Policy and Practice”](#) (2012), the generation and flow of knowledge in education remain dominated by “producer-push” models. Most efforts focus on testing the effectiveness of programs, practices, and interventions to determine what works and then pushing this information out into the field. The most visible example of this is the Institute of Education Sciences’ What Works Clearinghouse.

While this approach generates useful knowledge, by itself, it is insufficient for system learning and may have unintended negative consequences. Education is already a highly fragmented sector. Adding on additional programs and practices — even effective ones — without enough attention to how they are integrated into the existing system risks more fragmentation. Such piecemeal solutions may not address the most important underlying causes of problems.

Anthony S. Bryk, president of the Carnegie Foundation for the Advancement of Teaching, has argued that while the research produced by this focus on evidence-based programs and policies may be “conceptually and technically strong, it’s also highly compartmentalized and discrete. But the problems educators seek to solve are not compartmentalized nor discrete” (2017, p. 15). If research tackles siloed problems, then solutions may contradict rather than reinforce or complement each other, adding to the education sector’s fragmentation and misalignment.

The producer-push model has also resulted in a system where researchers often are disconnected from the questions and problems that practitioners and policymakers care about most. The timelines and research methods chosen often make studies too costly and slow to meet policymakers’ and practitioners’ needs (Penuel and Gallagher 2017). Although there are emerging efforts to better align research and researchers with the needs of practitioners and policymakers, such as research–practice partnerships (RPPs), education

research remains primarily driven by academic interests, incentives, and funding opportunities rather than by the problems of practice and needs — or insights — of schools and districts (Jones et al. 2019).

“If we are serious about producing and using evidence to inform policy and practice,” said James Kemple, the executive director of the Research Alliance for New York City Schools, “we need to create more collaborative partnerships in which researchers make themselves available to address questions that policymakers and practitioners care most about rather than those that their research peers may care most about. Then, researchers need to be willing to present the evidence as it is being generated, rather than just at the end of a long, multiyear study.”

“If we are serious about producing and using evidence to inform policy and practice, we need to create more collaborative partnerships in which researchers make themselves available to address questions that policymakers and practitioners care most about rather than those that their research peers may care most about. Then, researchers need to be willing to present the evidence as it is being generated, rather than just at the end of a long, multiyear study.”

— James Kemple, Research Alliance for New York City Schools

“For their part in this collaboration,” Kemple added, “policymakers and practitioners should be willing to accommodate researchers’ ability to produce and communicate such evidence by opening innovative initiatives to rigorous study, including studies of implementation and costs. It is also important that they be sensitive to the nuances of what the evidence says and does not say.”

Many of those we interviewed highlighted the need to focus more on issues of implementation. “One gap is the gap between a research finding that says ‘this works’ and a very pragmatic, step-by-step implementation plan for how to do it in your own context,” said Amy McIntosh, education consultant and former acting assistant secretary for policy at the U.S. Department of Education. “Even if someone wrote down step-by-step, ‘This school district with this research finding did XYZ and then wrestled with the following 15 problems and solved them this way,’ it’s very hard for the next school district to just literally replicate it.”

“Even the randomized control trial doesn’t necessarily tell you what parts of the implementation were the things that really mattered,” she added. “I would like to see ways that research techniques could support faster cycles of learning and adjustment and relearning.”

Alan Ginsburg and Marshall S. Smith underscore this point in “Do Randomized Controlled Trials Meet the ‘Gold Standard’? A Study of the Usefulness of RCTs in the What Works Clearinghouse” (2016). Based on a review of 27 randomized controlled trials (RCTs) on math curricula, they concluded that attention to implementation questions was “scattershot” (p. 9) and that fidelity of implementation was not considered sufficiently in developing effectiveness ratings.

Tseng (2012, p. 12) observed that “the research community has come a long way in strengthening standards of evidence on what works, but little progress has been made on critical questions for the would-be adopters of programs. Their questions about what it takes to implement programs and whether they would

be effective with different populations, under different operating conditions, and in different contexts have been studied too infrequently. Building a robust evidence base on these questions should be a priority.”

Yet current incentive structures in higher education — from what gets published to tenure and promotion policies — do not prioritize a focus on pressing problems of practice. “As many have pointed out, the incentive structures in universities privilege theory-driven over practice-driven research,” note Penuel and Gallagher (2017, p. 153), “and tenure review committees have difficulty sorting out just how to attribute credit for collaborative research that involves more than one investigator.” A further problem, they observe, is the familiar model of awarding funding only to researchers, even when they work closely with districts, rather than awarding more collaboratively funded grants in which researchers and educators hold the purse strings.

Context matters. Just knowing something worked someplace else is not enough. A four-year longitudinal study of research use in two urban districts with large numbers of low-performing schools found that educators placed a premium on evidence of what would work in their local contexts and expressed doubt that what works in one place would work in others (Finnigan et al. 2013). This finding echoes those from an earlier study, which showed that a broad range of education stakeholders valued research conducted with local data or in sites that are similar to theirs in terms of size, demographics, and urban versus rural location (Nelson et al. 2009).

Challenge 5: The field lacks commonly agreed-upon evidence standards and a common vocabulary.

For the education sector to become a learning system, researchers, policymakers, and practitioners must agree on what constitutes evidence that particular practices, programs, or interventions are achieving their desired outcomes. But what counts as evidence remains a highly contested topic.

ESSA sought to address this issue by defining four tiers of evidence:

1. *strong evidence*, based on at least one well-designed and well-implemented experimental study;
2. *moderate evidence*, based on at least one well-designed and well-implemented quasiexperimental study;
3. *promising evidence*, based on at least one well-designed and well-implemented correlational study with statistical controls for selection bias; and
4. *strong theory*, based on a rationale stemming from high-quality research findings or a positive evaluation that requires continued investigation.

But while experimental studies or RCTs are important, there are many types of evidence that can be useful, depending on what decision policymakers or practitioners are trying to make. The William T. Grant Foundation’s (2016) definition of research evidence, for example, includes descriptive studies, intervention or

evaluation studies, meta-analyses, and cost-effectiveness studies that apply systematic methods and analyses. While rigorous, RCTs are often too slow, expensive, and narrowly focused to answer all the questions practitioners and policymakers have (Penuel and Gallagher 2017; Project Evident 2017).

“Two things are sometimes in tension,” said Andrew Rotherham, a founding partner of Bellwether Education Partners, an education consulting firm. “One, there is a hierarchy of evidence. If you’re going to generalize from something, you want to generalize from the most rigorous work possible, and a pile of anecdotes is not the same as a well-designed RCT.

The other reality that’s in tension with this is that in public sector policymaking roles, you often must make a decision in a really time-bound way based on imperfect and incomplete information. So then you have to be a smart consumer and know how to rate and weight these different factors.”

In determining the level of rigor needed to make a specific decision, practitioners and policymakers must weigh multiple factors, including the cost of the intervention, its duration, whether it is in the early stages of design or a later phase of development, whether it is a small-scale pilot or a large-scale implementation, the level of possible future investments, and how central the intervention is to the organization’s mission and outcomes.

“What you want to do is bring the best research and data you can to a problem,” said Vivien Tseng, senior vice president of programs at the William T. Grant Foundation, in an interview, “and also understand that experience needs to be brought to the table, professional judgment needs to be brought to the table, considerations of politics and values. In many ways, this is just about better decision-making, and are we focusing on the right problem? And then the methods, the tools, come after that.”

A number of those we interviewed expressed concern that current student outcome measures, focused on test scores, are both too narrow and too distal to assess student-centered learning designs that are still in their early stages of implementation. Todd Kern, a founder and partner of the education design lab 2Revolutions, expressed worries that unless the field can come to an agreement about what constitutes evidence for different purposes, “we could fall into border wars and skirmishes” between those who are trying to transform the system through the rapid prototyping of new ideas and those engaged in a reform movement anchored in narrower definitions of evidence.

Several interviewees also identified a lack of common vocabulary in education research as a barrier to progress. Concerns ranged from the differing descriptions and definitions of the types of research that constitute a robust and comprehensive research framework to the multiple definitions and frameworks that characterize particular bodies of research, such as social and emotional learning. “When outcomes, constructs, or

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— Vivian Tseng, William T. Grant Foundation

competencies have multiple names and definitions ... it becomes much harder for researchers, practitioners, and other stakeholders to sort through such an extensive body of research to determine where the links between evidence, strategy, and evaluation exist,” argue Harvard researcher and professor Stephanie Jones and colleagues (2019, p. 5), in calling for a new research paradigm. “Research for the next generation employs terminology that is transparent, precise, and specific, ensuring that stakeholders work with a common and shared understanding of the core constructs and ideas” (p. 6).

“We don’t have a widely shared stock of information because we don’t have coherent taxonomies or terminologies,” noted one interviewee. “Educators are unique because everybody moves to specialize their language and not to try to unify it. That failure is just painful.”

Challenge 6: Approaches to diffusing knowledge do not reflect how stakeholders acquire and use information.

The producer-push approach limits not only knowledge generation, but also knowledge sharing and use. These have relied mainly on a dissemination strategy in which policymakers and practitioners are expected to consume research results in the form of journal articles, research reports, case studies, and syntheses. Yet extensive evidence has found that stakeholders at all levels of the education system — teachers, principals, district leaders, and policymakers — primarily rely upon peers, personal networks, and professional associations to access knowledge rather than official channels (Tseng and Nutley 2014; DuMont 2015; Anderson and Goldstein 2015). Peer-to-peer sharing also is the most effective way to communicate knowledge in other sectors, such as the oil and gas industry, the automotive industry, and the aerospace sector (Franks 2017). Moreover, the most useful knowledge is timely, actionable (i.e., embedded in tools, protocols, rubrics), and context-specific (DuMont 2015).

“Everybody is going to trust their network. That’s how we all make decisions. The trick is helping people to have a more informed network to ask in the first place.”

— Andrew Rotherham, Bellwether Education Partners

“Relationships and professional networks are critical to acquiring research evidence,” writes Kim DuMont in [*Leveraging Knowledge: Taking Stock of the William T. Grant Foundation’s Use of Research Evidence Grants Portfolio*](#) (2015, p. 27). “Policymakers’ relationships shape what research evidence individuals and organizations acquire and how they make sense of it. Leaders often turn to trusted peers in similar settings to access information.” Focus groups and in-depth interviews with 50 state legislative leaders and education chairs from both parties by the Aspen Institute Education and Society Program yielded similar findings, indicating that “legislators’ opinions are first and foremost influenced by their personal experiences and relationships” (Anderson and Goldstein 2015, p. 5).

Similarly, a recent survey of more than 700 school and district leaders by the National Center for Research in Policy and Practice found that respondents were most likely to access research through their professional associations, professional conferences, and colleagues in other school districts. A majority of respondents

indicated that they rarely or never acquired research from the What Works Clearinghouse, the National Center for Education Statistics, the Regional Educational Laboratories, or university researchers (Penuel et al. 2016). The biggest perceived barrier was the timeliness of research. Fifty-two percent of respondents agreed or strongly agreed that “by the time research is published it is no longer useful to me.”

In making decisions in D.C. Public Schools, Kaya Henderson said, “I can tell you what I did not do, which was read a bunch of research and reports. That was not the thing that made me know what to do at all.” Instead, the district held what she called “big brain meetings, where we put together a hypothesis around a problem we were trying to solve and invited experts and nonexperts to help us think through the whole problem together. And we learned a lot.” She also pointed out the helpfulness of meetings with small groups of other urban superintendents in which they drove the agenda.

Despite the importance of relationships in acquiring research and evaluating its trustworthiness, the field too infrequently leverages the power of networks to enhance knowledge dissemination and use (Tseng and Nutley 2014). “We have these researchers who develop things, and other people study things, and other people are supposed to use what they have learned,” said Carnegie Foundation for the Advancement of Teaching’s Anthony Bryk in an interview. “It isn’t how knowledge diffuses, going all the way back to the early work on the diffusion of innovations. It’s good to have evidence, but people pick things up because people they know have tried it, and it gets carried through relationships.”

“Everybody is going to trust their network. That’s how we all make decisions,” said Bellwether’s Andrew Rotherham. “The trick is helping people have a more informed network to ask in the first place.”

One concern expressed by Michael J. Feuer (2016), dean of the school of education at George Washington University, is that many think tanks and advocacy groups, including those funded by foundations, have agendas that may diminish the objectivity of the knowledge they provide to decision-makers. Carmel Martin, the former head of policy at the Center for American Progress, told us: “On the Hill, most staffers would get a large majority of their information from advocacy organizations that were actively lobbying them ... because many of them don’t have time to do their own research.” This dynamic applies to educators as well, who are neither expected to make regular use of research evidence nor provided the structures, time, and supports to do so.

More focus also is needed on the translation of research into formats that are relevant and timely for practitioners. As Jones et al. (2019, p. 12) note, “The products coming out of education research can be much more intentionally crafted to be relevant and accessible to educators and policymakers. Part of a new research paradigm includes taking the next step, beyond producing articles for academic journals, to also craft field-facing summaries that provide guidance for educators and call out specific applications in practice. Oftentimes this will require collaboration with practitioners to get guidance and feedback on framing and relevance.” According to Timothy Knowles, president of the Academy Group, there is also a need to bundle single-point solutions into a coherent whole. Such resources might take the form of inventories, playbooks, or roadmaps that schools or systems could use to develop more coherent planning. The information must also be presented in a way that makes sense to educators and applies to their contexts.

Research from education and other fields has found that to change behavior and beliefs, personal ties and social influence matter. There is also evidence from numerous reviews that social and online media are effective communication tools, in part because they allow for back-and-forth engagement and access to information anytime and anywhere, rather than just the passive dissemination of knowledge. “The power of social networks is well-known but under-used,” argues the Behavioural Insights Team in the U.K. “We believe that governments looking to engender widespread change should not focus solely on individuals, but consider their networks as well” (Service et al. 2016, p. 33). Drawing on social science research, the team argued that the way to encourage a behavior is to “make it Easy, Attractive, Social, and Timely (EAST)” (Service et al. 2016, p. 4). In laying out the EAST framework, the team suggests that people are more likely to change their behavior if they believe most people in a particular situation are engaged in that behavior; if they are part of a network that enables collective action, mutual support, and the peer-to-peer spread of behaviors; and if they make a social commitment to others to change.

Many organizations are working to develop more actionable knowledge in the education space. But user testing, a practice in software development for assessing the usability and value of tools for a specific population, remains uncommon outside of the education technology sector. A review of the literature on what works to increase research use by the Alliance for Useful Evidence in London concluded: “What’s needed, according to the evidence, is to think more like a marketer. Look at audience segmentation, personalized and tailored messages, user-friendly design. Put yourself in your audience’s shoes. What do they really need, right now, to help them make decisions in the office, classroom, or clinic?” (Breckon and Dodson 2016, p. 12).



DATA INFRASTRUCTURE

Challenge 7: The culture of data use needs to be strengthened, and concerns about data privacy and security need to be addressed.

Access to accurate, timely, and tailored data lies at the heart of improvement processes. “You can’t fix anything, you can’t have a learning enterprise, unless you have information to inform that process,” said Aimee Rogstad Guidera, who formerly led the Data Quality Campaign.

Most data systems in education were built for compliance and accountability purposes, yet we are now asking these systems to share data across silos to provide insights into questions about learning. Such functionality is possible, but it requires that numerous challenges be addressed, including interoperability issues; interpretations of privacy laws that keep practitioners from linking or sharing data in appropriate ways; the lack of effective and authoritative P-20 data governance; and the lack of training and capacity throughout the system to access, analyze, and use data for continuous improvement.

Amy McIntosh who has held leadership roles at the New York City, New York State, and federal levels in public education and at the City University of New York, told us, “The two sources that are the most galvanizing

are, first, your own data about your own system on whatever problem you're trying to solve; and second, diving into comparisons, for example, variations in school or teacher performance within the system or variations in performance over time. And it often involves liberating your own data and using people who know how to analyze and visualize and display data, so that people who have the best interests of kids at heart can start to ask questions and peel back layers of the onion."

Kaya Henderson, former chancellor of D.C. Public Schools, expressed similar ideas: "Data enabled us to be a learning organization. Data was both a window and a mirror. It helped me ask and answer questions at the same time, and it was a tool that enabled people to act on the data that they saw. It drove a lot."

Ultimately, Guidera argued, creating a culture of data use in education is a change management issue: "We have not changed the culture enough in education to value and use data." Doing so will require changes in policies, including in accountability systems, in educator preparation and training, in the use of technology to package and deliver information, and in the integration and accessibility of data systems.

ESSA places many new requirements on states and districts to provide more transparent and user-friendly data reports, particularly when it comes to school and district report cards. While public reporting of data has gotten better under ESSA, a 2017 report from the Data Quality Campaign indicated that most states' report cards still need improvements to be accessible, meaningful, and useful to a wide range of audiences, including parents and communities. A follow-up report in 2018 showed that while parents and teachers want better data, it is often hard to access: More than 4 in 10 parents indicated that they had not looked at school or district report cards in the past 12 months. Among those parents, 40 percent said they were unaware that the resources existed, and 32 percent said they did not know where to find the report cards. Among teachers, 86 percent agreed that using data is part of being an effective teacher, but 34 percent reported that there is so much data that they cannot determine what is most important, and 57 percent indicated that they do not have time in the school day to access and use data. In their ESSA plans, 19 states described efforts to redesign their school report cards to be more accessible to the public. About one-third — 94 out of 300 — of the bills related to education data in 2018 focused on updating public reports, including state report cards (Data Quality Campaign, 2018).

While more accessible and user-friendly data is desirable, broad public anxiety about who has access to personal data has contributed to concerns about the privacy and security of education data. Further, parents may worry that student data records will label their children for life, that government bodies are intruding into local affairs, and that commercial interests are trying to find yet another way to creep into classrooms. Over the last six years, 43 states have enacted 116 new laws expressly addressing the privacy and security of education data (Hochleitner 2019). States play a critical role in developing, enforcing, and communicating policies that build on the

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foundation of federal privacy laws, including the Family Educational Rights and Privacy Act (FERPA). But Guidera noted that states must go beyond compliance with federal and state laws and engage with the public to build value and trust in the use of education data. Additionally, student privacy laws and practices need to be updated to reflect digital data and cybersecurity threats.

Section 3

Systems Change

Any discussion of how we could enable our education system to shed its longstanding compliance orientation and function more like a learning system must include a consideration of how difficult it is to move any change through our complex system and sustain it over time.

The education system is deeply entrenched in its existing structures and processes and resistant to change for several reasons, as we noted in our previous paper on learning systems (Gordon et al. 2019). It is a fractured, decentralized system with multiple levels of overlapping, often unclear lines of authority and responsibility. It is also a deeply human system, driven by individual beliefs, relationships, and judgments, and it is a public system, frequently at the center of political debates and cycles. Those pursuing changes to the system must also contend with a status quo that often benefits some — typically those who control the levers for change — at the expense of others.

More significantly, systems tend to get the results for which they are designed. Schools and classes in the U.S. education system were mostly organized for individual teachers to work with specific, age-based student cohorts. Educators were by design chiefly responsible for their own practice and improvement, disconnected from systemic policy decisions. State education agencies were built to distribute funds, monitor compliance, and, more recently, hold other institutions in the system accountable. Any effort to push significant change through the education system must grapple with this disjointed design — and resulting inequities — and confront the fact that making education a learning system will require profound changes.

A full discussion of systems change in education is beyond the scope of this paper, but it is important to acknowledge the centrality of the issue and to highlight a few key points to provide context for our recommendations. There are many models for thinking about and approaching systems change, including in social sectors such as education, but they embody similar principles. Systems change requires a consideration of the many levels and players in the system, the multiple forces that motivate them, and the relationships among them (Kania et al. 2018). Some experts on systems change have described the education system (and similar complex, human systems) as similar to an organic, living thing rather than independent entities operating according to a set of discrete rules; it is impossible to move one part of the body without affecting every other part. Further, any system will work to preserve the steady state for which it was designed (Dolan 1994).

The challenges of moving to a learning system in education are likely significant, given that the change we seek to advance is not just one evidence-based program or policy but a fundamental change — a shift from a compliance orientation to a learning orientation at all levels of the system, from policies to institutions to individuals. Transforming education into a learning system will likely be a long-term endeavor requiring an array of strategies, involving different levels of the system in balanced, sequenced, and integrated ways to transform both structures and culture. But different strategies likely vary in effectiveness at different levels of the system. Pushing too hard with one strategy relative to others — such as advancing top-down policy far in front of communications and training support, or proof points without connections to policy structures — is likely to yield limited systemic change and myriad negative consequences.

Reformers should also be aware of the concept of the *innovation adoption curve*, often referenced in the technology sector (see Figure 3) (Rogers 1962). At each level of the education system, there may be actors who are deeply interested in a given change, including the shift toward a learning system approach, and who are already taking steps to advance that change by swimming against a strong current. Harnessing and extending those innovators' efforts to early adopters and then enlisting an early majority may help move the entire system to a new normal. This approach has concrete implications for systems change efforts in education, including the need to map, support, and build connections between leading efforts in the field and to promote demonstrable early wins.

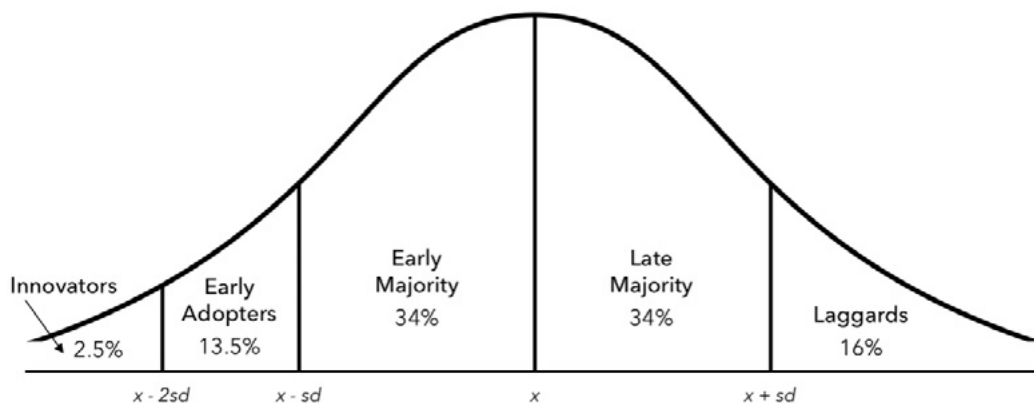


Figure 3

Relationship between types of adopters classified by innovativeness and their location on the adoption curve.

Source: Everett M. Rogers, *Diffusions of Innovations*, 5th ed. (New York: Free Press, 2003), p. 281

Finally, one point raised consistently in our meetings with experts and practitioners is that to advance toward a learning system that is self-sustaining, our strategy must focus from the beginning on both structures and culture. It is not enough to create the structures for a learning system without cultivating trust and belief among the people in that system, nor to build interest in change without infrastructure and capacity. Learning system advocates must focus on both structures and culture. The good news is that the change we seek is fundamentally a change in mindset, which is one of the strongest leverage points for sustained systems change (Meadows 1999). Early steps in this process should include establishing a shared vision among the many key players in the system, who can then help lead further change.

Section 4

Recommendations

Moving toward a learning system is a long-term endeavor requiring multiple actions by various actors at different levels of the system over many years. Given the complexity of this process, it can be difficult to determine where to start. But several actions can be taken now, and many efforts already underway can be sustained or expanded.

The following six recommendations are ripe for action and would meaningfully advance our vision, including laying the foundation for future efforts and broader shifts. These recommendations represent critical first steps toward addressing many of the challenges described in Section 2, albeit not in a one-to-one fashion. They also reflect some of the principles of systems change described in Section 3.

We organize these recommendations according to the four key drivers of a learning system:

- **human capacity**, with the skills, knowledge, and mindsets needed to facilitate and engage in improvement efforts;
- sufficient and sustained **resources** to build and strengthen the learning system over time;
- the **leadership** required to establish a vision of a learning system and execute on it; and
- the right mix of **policies and incentives** to remove barriers and empower people at all levels to embrace a learning orientation.

It is worth noting that implementing any of our recommendations will implicate all four drivers and not just the primary one highlighted for each. For example, efforts to build research–practice partnerships (RPPs) exist at the intersection of an R&D infrastructure and a continuous improvement infrastructure, and they implicate not only resources but also human capacity, and perhaps leadership and policies and incentives. What is more, every effort to shift toward a learning system approach must attend to the intertwined concepts of culture and design. In multiple ways, these recommendations demand that we reject our current silos and embrace integration and coherence.¹ This change in mindset is critical to overcoming the inertia of the status quo and to our goal of building an integrated, dynamic learning system.

1) [In From Fragmentation to Coherence: How More Integrative Ways of Working Could Accelerate Improvement and Progress toward Equity in Education](#) (Srinivasan and Archer 2018), Carnegie Corporation of New York argued that because “educational reformers often create conflicts for educators, students, and families by moving ahead with solutions before fully understanding the nature of the problem to be solved, or the context in which it takes place,” we need “a learning agenda on how to build the capacities of organizations to work in ways that produce greater integration of effort, and less fragmentation” (p. 1). To begin developing and exploring that learning agenda, members of the [Integration Design Consortium](#) are testing ways to reduce fragmentation and accelerate integrated approaches to advancing equity.

PRIMARY DRIVER	RECOMMENDATION FOR EARLY ACTION
HUMAN CAPACITY	<p>1. Define the capacities we need. Agree on and describe the knowledge, skills, and mindsets required for individuals at every level — federal, state, district, school, and classroom — to support a learning system.</p>
RESOURCES	<p>2. Invest more in the education R&D infrastructure. Use existing R&D funding and seek additional investments to improve the current infrastructure and create new capacity.</p> <hr/> <p>3. Invest more in Research-Practice Partnerships. Expand the role high-quality RPPs play across the education system by creating new RPPs, strengthening existing ones, and connecting them through networks to drive continuous improvement.</p>
LEADERSHIP	<p>4. Identify, connect, and develop the field of learning system leaders. Create structures that support current leaders in working together to develop and enlist new leaders at all levels of the system.</p>
POLICY AND INCENTIVES	<p>5. Capitalize on ongoing efforts to implement ESSA. Harness the resources and energy being applied to the implementation of ESSA to begin or advance the shift toward a learning system approach.</p> <hr/> <p>6. Develop a learning systems policy framework. Articulate a set of model policies to help align policies and incentives to an overall vision of a learning system so that policymakers can audit their current policies and revise them where necessary.</p>

Critically, these recommendations must be implemented with explicit attention to equity. Otherwise, attempts to advance toward a learning system approach in education could serve the few rather than the many and unintentionally uphold or exacerbate systemic inequities. For example, students and communities underserved by the status quo must be prioritized when deciding where to help develop learning systems. What is more, these communities must not only receive the benefits of more and better R&D but also actively contribute to its design and implementation. To the extent that existing systems, policies, or practices privilege some while oppressing others, we have a moral imperative to design equitable systems and improve them over time. If we do not, we might perversely use a learning system approach to make our current system *better* at maintaining inequities.

For each of the four drivers, we offer one or two primary recommendations for action that in our research, interviews, and convenings garnered widespread interest and enthusiasm. We briefly discuss how these recommendations might be implemented and why they are important for advancing a learning system. Where relevant, we highlight existing initiatives that align with our recommendations or the driver in general. We conclude our discussion of each driver with a preview of further actions that might advance our goals.



HUMAN CAPACITY

The education sector can only develop the culture and structures of a healthy learning system if its professionals and stakeholders have the knowledge, skills, and mindsets needed to drive shifts in roles and structures. Because human capacity is the lifeblood of any social sector organization or system, all efforts to shift toward a learning system must include a strategic focus on this driver. Developing capacity requires efforts throughout the career cycle, from recruitment and preparation to evaluation, promotion, and professional learning at every level of the system. We will need to take better advantage of the capacity already in place; help staff develop essential knowledge, skills, and mindsets; and, where necessary, invest in new roles and teams. An important early step in this work is to demystify the concept of a learning system so that stakeholders can understand in concrete terms what it means to be part of one.

RECOMMENDATION 1: Define the capacities we need.

Agree on and describe the knowledge, skills, and mindsets required for individuals at every level — federal, state, district, school, and classroom — to support a learning system.

Every person in the education system has an important role to play in a learning system. While it is important to support teachers and school leaders to engage in continuous improvement, key players at other levels of the system must be similarly equipped and inclined to support ongoing learning. If those other stakeholders do not value the creation of a learning system, efforts in individual schools will not be sustainable. The importance of investing in people at all levels to build their capacities and alter their responsibilities was one of the most prominent themes that emerged from our research and discussions. We can start by working with leaders and practitioners throughout the system to make all roles more explicit and concrete.

This work might proceed in several phases:

- First, identify existing roles and stakeholders, gather and crosswalk existing frameworks that outline the capacities they need, develop a common vocabulary around these capacities, and identify any previously unarticulated but critical roles and capacities.²

2) While rubrics and guidelines regarding critical capacities exist, they tend to focus on organizational capacities (such as the Strategic Data Project's rubric for organizational data use, Results for America's Standards of Excellence for government data use, and 2Revolutions' outline of skills needed to build a culture of innovation). Our recommendation addresses a gap in the literature on learning organizations by focusing on the capacities needed across the range of *individual* roles.

- Second, define the knowledge, skills, and mindsets needed in existing and new roles throughout the system.
- Third, disseminate these definitions in accessible formats customized for the audiences most likely to help develop human capacity. These translations should help people understand their role(s) in a learning system and should include tools for use in talent management (e.g., job descriptions, course syllabi, certification designs, coaching and feedback systems).

A national working group or commission could be charged with the entire project, or a loose network of organizations could each tackle their most relevant roles. Regardless of how the work gets done, those leading it must engage widely with diverse stakeholders, facilitate collaboration across roles, and maintain a focus on equity. Philanthropic organizations could provide the required resources, especially since the work would benefit the entire field but would likely be hard for publicly funded entities to justify in their budgets.

WHY THIS WORK IS IMPORTANT

Insufficient understanding and human capacity topped the list of concerns raised in our research about how to advance toward a learning system approach. To build an education learning system, we need each actor in the system to understand — and be prepared for — their own role in it, and to understand the roles that others play. In working to define capacity needs, stakeholders may identify new roles that might be created. Examples of such innovative roles include:

- chief data officers, as required by the [Foundations of Evidence-Based Policymaking Act of 2018](#);
- chief research officers at state education agencies, who serve as [brokers](#) between researchers and educators (e.g., the Massachusetts Department of Elementary and Secondary Education’s [Office of Planning and Research](#)); and
- master educators in schools, who lead job-embedded, data-informed professional development cycles (e.g., the D.C. Public Schools [LEAP Leaders](#)).

If we want more people to understand what a learning system is and see themselves in it, they need to know what is required of them in their day-to-day work.

Capacity concerns are not only relevant for frontline professionals in school buildings, though there is certainly much work to be done to prepare and support educators, leaders, and support staff to fulfill their critical roles in a learning system. Notable capacity gaps exist among professionals at every level and in every corner of education. For example, a federal program officer who has always monitored state grantees’ compliance may need guidance to engage in conversations rooted in continuous improvement. Similarly, a traditionally trained academic may need support to start crafting research questions that respond to the authentic needs and insights of practitioners.

We have found that people from many different perspectives can readily relate to our overall vision of a learning system. Yet it is sometimes harder for them to see their own role in it, or how their role relates to someone else's. Ideally, the effort to clarify what capacities we need can foster more understanding and even collaboration (e.g., between the “innovation” community and the “evidence” community). And while this is hard work, it is important to acknowledge that success here does not require resolving every dispute or convincing everyone to adopt the same approach.

Further Efforts to Develop Human Capacity

Once we help stakeholders understand what it means to function as a learning system, the truly challenging work will begin — helping them develop the articulated knowledge, skills, and mindsets and advancing the cultural or structural changes necessary to support their development. All professional training or development initiatives must fully incorporate the defined learning system capacities. We may need to transform the nature of professional learning itself, especially at the school level, to embed systems of individual and collective learning that leverage data and feedback loops for continuous improvement. In general, this next phase of work will require funding and leadership to develop resources and tools (e.g., practice guides and tools for using research evidence), enlist and coordinate an array of relevant actors (e.g., teacher and leader preparation programs, human resource departments at state and local education agencies), and ensure these supports do not flow only to those who are most ready but also (and particularly) to those with the greatest need.



RESOURCES

Establishing, strengthening, and sustaining a learning system in education requires reallocating existing resources and investing additional resources at each level of the system — and not just in terms of funding, although funding is critical. Necessary resources also include, for example, new organizational designs, more and different uses of time, human capacity, data systems, and feedback loops.

Our two recommendations for early action approach the issue of resources in different but complementary ways, with a specific focus on R&D infrastructure. First, we recommend advocating for significant increases in education R&D spending, both to increase the supply of research evidence and innovation and to improve the R&D infrastructure itself. Second, we recommend expanding and strengthening research–practice partnerships (RPPs), which hold great promise as a means of addressing many of the challenges identified in Section 2. These are not small tasks, but the need is great, and the time is ripe for action.

RECOMMENDATION 2: Invest more in the education R&D infrastructure.

Use existing R&D funding and seek additional investments to improve the current infrastructure and create new capacity.

The rising interest in learning system approaches should provide a window of opportunity to address the longstanding underinvestment in education R&D, especially at the federal level. We simply need more resources invested in the R&D infrastructure. With additional federal funding — potentially augmented by state, local, and philanthropic funding — we could improve the relatively small existing infrastructure and create new capacity, particularly to expand the development side.

As we build buy-in for a learning system approach, we must also deepen support for existing organizations and coalitions advocating for R&D investments in education (e.g., the funding advocacy platforms of [Knowledge Alliance](#) and the [American Educational Research Association](#)) and support new capacity and connections. Advocacy should follow multiple parallel paths that take advantage of opportunities wherever we can find them (e.g., upcoming election cycles or congressional action) and remain connected to each other. Specific approaches to expanding R&D capacity include:

- **Making better use of resources that are often overlooked in education R&D.** We might look both to large existing sources, such as R&D funding at the Department of Health and Human Services, National Institutes of Health, and National Institute of Child Health and Human Development, and to smaller, more niche sources, such as the Naval Science, Technology, Engineering and Mathematics (STEM) education program and workforce initiatives at the Department of Defense’s Office of Naval Research.
- **Seeking additional funding from Congress.** One key opportunity — and forcing event — on the horizon for increasing R&D investments is the pending reauthorization of the Education Sciences Research Act (ESRA), which authorizes the Institute of Education Sciences and is currently the single most significant investment in education R&D. An ESRA reauthorization agenda could include both increases in funding and improvements to existing approaches to address some of the challenges discussed above. (Similar efforts should take place at the state level.)
- **Creating new models of R&D investments.** Education R&D advocates should consider innovative models such as establishing for education an entity analogous to the [Defense Advanced Research Projects Agency](#) or the National Science Foundation’s [Small Business Innovation Research](#) program (also known as America’s Seed Fund). The National Science Foundation model illustrates how government or philanthropy dollars could support innovation and evidence in development by making seed grants that allow for proof of concept, which then can be followed by increased funding for implementation research on how effective interventions work in different contexts and with different learners. In education, further innovations could emerge from leading-edge R&D models, such as [LEAP Innovations](#), an intermediary organization working “directly with educators and innovators to discover, pilot and scale personalized learning technologies and innovative practices,” and the newly launched [EF+Math Program](#), which seeks to support multidisciplinary, inclusive R&D teams that place educators “at the center” to create prototypes integrating executive functions and math learning for students in grades 3–8.

WHY THIS WORK IS IMPORTANT

R&D in education is significantly underfunded compared with that in other fields. The U.S. Department of Education and the National Science Foundation together fund the majority of education R&D, with spending of about \$800 million per year. This figure pales in comparison to investment spending in other sectors, with R&D accounting for 0.4 percent of education spending compared with 6.3 percent in health, 12.3 percent in defense, and 46.1 percent in energy (Bill & Melinda Gates Foundation 2017).

Having a small R&D infrastructure constrains the shift to a learning system in several ways. On the research side, although the evidence base has grown, it remains thin. Moreover, basic research (especially that funded by the National Science Foundation) currently focuses mostly on STEM-related fields, potentially leaving other key and emerging areas underresearched. And while the design and rigor of education research have improved over time, additional funding could spur significant improvements. Education also has a lower study replication rate (0.13 percent) than other social sciences, which already trail behind the natural sciences. Finally, few studies assess the interactions between interventions, how interventions interact with contextual characteristics, or how they interact with individual student characteristics.

The development side in education is even further behind that in other sectors. Unlike defense and energy, which have governmental agencies dedicated to developing commercially viable products, education has no central developer or centralized funder.

Of course, increased funding is not enough on its own to support the shift to a learning system, but it is essential to the broader effort.

RECOMMENDATION 3: Invest more in Research-Practice Partnerships.

Expand the role high-quality RPPs play across the education system by creating new RPPs, strengthening existing ones, and connecting them through networks to drive continuous improvement.

Two main strategies are necessary for maximizing the potential of RPPs to create closer connections between research and practice:

- First, we must create new RPPs and strengthen existing ones to facilitate sustained joint problem-solving by researchers, policymakers, and practitioners to improve student outcomes. State education agencies should all have robust, sustainable RPPs that help states pursue a learning agenda. Where practicable, districts should also form their own RPPs. Smaller districts might form a research alliance to pool their resources and data, and in some contexts, a vertically integrated model involving both the state and district levels could be a powerful approach. Whatever the model, these partnerships should be informed by emerging research findings on what makes RPPs effective, and they must have the infrastructure, data, and other enabling conditions necessary for them to serve as proofs of concept for a learning system approach.

- Second, education RPPs should be networked for improvement, with the support of a well-resourced hub or similar centralized structure that enables and accelerates shared learning across individual, place-based RPPs. The hub should map the focus of existing and planned studies, connect RPPs interested in exploring similar questions, identify inequities and how RPPs individually and collectively can help dismantle them, spread promising results and practices, develop useful tools and models, help cultivate the next generation of RPPs, and support the pathway to sustainable funding.

Both of these strategies build on existing promising efforts. For the first, there are an increasing number of place-based RPPs supporting state agencies (e.g., the [Tennessee Education Research Alliance](#)), large school districts (e.g., the [University of Chicago Consortium on School Research](#)), and coalitions of states (e.g., federally funded [Regional Educational Laboratories](#)) or districts (e.g., [Proving Ground](#)). For the second, the [National Network of Education Research-Practice Partnerships](#) (NNERPP) and others have begun connecting individual RPPs to advance shared learning and to improve RPPs' effectiveness. Action on this recommendation, therefore, should start with those already leading the work.

To implement these strategies, RPP leaders and potential funders should work together to address critical design- and process-related questions, including the following:

- What is the right balance between investing resources in strengthening and sustaining existing RPPs, launching new RPPs, and designing innovative models for collaboration? How should RPPs relate to other research centers, including federally funded centers (e.g., regional educational laboratories and comprehensive centers)?
- How can we ensure that investments in RPPs advance equity? Strategies here might include connecting smaller and rural communities to research partners, developing research agendas that build evidence about ways to support various groups of students, and advancing new types of analyses that illuminate equity issues for researchers and practitioners.
- What research questions should be pursued to expand the evidence base on effective RPPs and the ways practitioners and policymakers use evidence?
- For RPPs connected to a hub, how standardized or customized should their approaches be? For example, many RPPs pair a single research institution with a single state or local education agency, but others are thriving with a multipartner approach (e.g., [Summit Public Charter Schools](#) and the [Massachusetts Department of Elementary and Secondary Education](#)).
- What would define success for a hub role, and how formal or informal should it be? Should it be newly formed, or is it wiser to invest in an existing entity such as NNERPP to expand its mission and intensify its supports?

WHY THIS WORK IS IMPORTANT

RPPs represent a promising approach to producing relevant and actionable research and helping policymakers and practitioners incorporate it into their work. They also embody the aspiration of greater connectivity, responding directly to some of the key challenges described in Section 2 by tailoring their approaches to knowledge creation to policy and practice needs (Challenge 4) and diffusing knowledge through an approach that reflects how stakeholders acquire and use information (Challenge 6). RPPs can explicitly model the ways in which the three learning system components or infrastructures must maintain two-way, dynamic relationships. These partnerships have made great progress in recent years, thanks to a combination of federal and philanthropic support, an increasing understanding that neither researchers nor practitioners benefit from operating in silos, and the passion and humility of RPP advocates.

There is still much to learn about RPPs — about their structure and governance; the negotiation of roles; the methods for building relationships and sustaining them through political, budgetary, and leadership transitions; the need to focus not just on relationship-building but also on improving student outcomes. But our research supports doubling down on RPPs as a strategy for advancing a learning system approach in education. RPPs are foundational to what we envision for each public education system, and they are well suited to filling gaps in the current system. With a central hub providing support, coordination, encouragement, feedback, and ongoing evaluation for continual improvement, participating RPPs can expand the reach of their work and grow more effective over time.

Further Efforts to Build Resources

Additional and future work could focus on responding to the other challenges discussed in Section 2 related to the R&D infrastructure. For example, if we do not work to understand and empower the demand side of evidence use and decision-making, we will not benefit from new research evidence and tools that result from an increase in R&D spending. Our recommendations about RPPs and building the field of learning system leaders will help, but there needs to be parallel work to connect R&D producers and consumers — and to take advantage of the expertise and insights of practitioners as part of R&D processes. Products are too often developed for and marketed to the field without rigorous evidence of their comparative effectiveness or input from practitioners. Developers have little incentive to conduct rigorous research because local education agencies and school purchasing decisions too often rely more on word of mouth, perceived alignment or fit, and strong sales pitches than on research evidence. Cutting-edge efforts such as the EF+Math Program and the Jefferson Education Exchange’s [EdTech Evidence Exchange](#) must become more of the norm for how education approaches R&D.

Further, just as the R&D infrastructure in education needs additional resources, so do the data infrastructure and the continuous improvement infrastructure. For example, although the data infrastructure has become more robust in the past decade, many states and districts still have limited capacity, especially around data analytics. What is more, many data systems, both within education and between education and other social sector agencies, remain siloed. Providing user-friendly access to data for research and improvement

efforts remains difficult, even though high-quality data lie at the heart of improvement efforts. Continuous improvement systems remain mostly nascent at the state, district, and school levels, with few staff dedicated to facilitating such efforts. More resources should be invested in supporting and spreading the systematic problem-solving approaches that have begun to take hold in leading schools and local education agencies (e.g., the Carnegie Foundation for the Advancement of Teaching’s [networked improvement communities](#), the Strategic Education Research Partnership (SERP) Institute’s [design-based implementation research](#), and the [effective implementation framework](#) developed through the George W. Bush Institute’s School Leadership Initiative).



LEADERSHIP

The shift toward a learning system approach in education will require clear, committed, ongoing leadership at all levels of the system — leadership that attends to the human side of change early and often. Strong leadership is essential to elevating the need for a learning system and shifting mindsets; dedicating sufficient resources to building and sustaining critical systems; defining shared goals to guide those systems; establishing supportive policies; energizing and engaging stakeholders; and empowering educators and others to take risks, make mistakes, and learn and improve from them.

A growing set of leaders nationally at various levels of the system are committed to shifting to a learning system and leading their organizations in that direction. They occupy the front end of the adoption curve discussed earlier. Others have some knowledge and motivation but need to be enlisted and supported to make the necessary changes. Accordingly, any set of recommendations for early action must include efforts to develop the field of learning system leaders and create a more connected foundation for systemic action.

RECOMMENDATION 4: Identify, connect, and develop the field of learning system leaders.

Create structures that support current leaders in working together to develop and enlist new leaders at all levels of the system.

We are not starting from scratch in our efforts to transform the education sector into a learning system. There are pockets of excellence (or at least promise) that should be identified, supported, studied, and, where appropriate, replicated with reasoned adaptation. Since 2017, for example, the Carnegie Foundation’s [Spotlight on Quality in Continuous Improvements](#) has been highlighting “examples of the rigorous application of improvement principles, methods, and tools to solve educational problems.” And via the Bill & Melinda Gates Foundation’s [Networks for School Improvement](#) initiative, more and more systems are engaging in systematic improvement efforts in partnership with a wide-ranging set of intermediary organizations, such as [Baltimore City Public Schools](#) and the [High Tech High Graduate School of Education](#).

Alongside the leaders of these educational systems, a growing number of leaders in the nonprofit sector are also advancing aspects of the learning system vision. Examples include not just the Carnegie Foundation but also [the National Network of Education Research-Practice Partnerships](#), which connects existing RPPs; Harvard University's [Center for Education Policy Research](#), which trains and places [data fellows](#) in state and local education systems across the country; the [Data Quality Campaign](#), which advocates for effective data policy and use; [Transcend](#), which brings R&D capacity to help communities design innovative schools; and design-thinking organizations such as [2Revolutions](#) and Stanford University's [d.school](#).

But to enable learning across the system at scale, we must more systematically identify, connect, and develop learning system leaders. Such leaders include early adopting chief state school officers, school district superintendents, and principals whose organizations will themselves need to function as learning systems, as well as leaders in academia, philanthropy, and technical assistance who are strengthening the learning system infrastructure. Early, high-impact actions that support this aim include the following:

- **First, fully map current efforts to help transform the education sector into a learning system.** Who is doing what, and where are they doing it? A regularly updated landscape analysis might identify relevant actors, provide descriptions and links to existing and developing resources, highlight gaps, and facilitate connections among leaders. It would also serve as a tool for the broader and deeper effort to enlist more leaders and match them with appropriate supports.
- **Second, regularly convene leaders who are building the learning system.** Their meetings can produce insights, begin to break down silos, increase understanding of the wide range of roles and work involved in a learning system, strengthen relationships, and surface opportunities and risks. This leadership group would need to be thoughtfully constructed to ensure broad representation and facilitated to advance a shared vision of a learning system that has students and equity at its center. Leaders' conversations would enable the flow of information among all stakeholders and inform critical decisions about strategy and resource allocation.
- **Third, develop a coordinated field-building strategy to enlist new leaders.** Given the ambition and scale of the overall goal, we cannot limit our efforts to the innovators or even the early adopters. We must support an aggressive enlistment strategy that will help us convince the early and late majorities (and eventually the laggards) to embrace learning system approaches. Early proof points will help persuade the leaders in these latter groups, but we need a comprehensive and cohesive field-building and support strategy to transform the system.

WHY THIS WORK IS IMPORTANT

Three themes emerged clearly from our research, interviews, and convening discussions that reinforce the need to invest in identifying, connecting, and developing learning system leaders:

1. We must attend early and often to the human, cultural side of transformation.

2. A necessary part of building a learning culture is persuading people that this work is important and showing them what it means.
3. Leadership at all levels must prioritize moving toward a learning system approach.

Meanwhile, even at the front end of the adoption curve, many efforts to advance toward a learning system are disconnected from one another. The reasons for this (and the consequences) differ depending on the context. In some instances, the disconnect stems from individual groups that are working in specific parts of the three infrastructures, not recognizing that they are all parts of a larger whole. In other cases, groups with similar missions and even similar methods simply do not know about each other. This results in missed opportunities, inefficiencies, and, for some, a sense of isolation.

By better connecting the people and organizations working to build a learning system infrastructure and culture, we can increase transparency and information sharing, identify opportunities for coordination and joint problem-solving, and maintain alignment even as individual efforts expand and deepen. In addition, strengthening this network can help individual groups engaged in learning system efforts to learn, improve, and grow faster. Ultimately, we need all actors in the learning system to understand each other's goals, incentives, challenges, and language. If those leading the charge are disconnected from each other, we are unlikely to succeed in coalescing into a broader movement.

Further Efforts to Advance Leadership

Leadership is deeply interrelated with the other drivers of change, and additional efforts to advance our leadership capacity will necessarily arise from the other recommended actions. For example, once we define the capacities we need for a learning system, we will need to develop those capacities in our leaders and help them do the same for their staff members. Further leadership-oriented efforts might include the following:

- To enlist more education leaders, we will need to better communicate about the vision of a learning system and the changes needed to manifest it. A future strand of work should involve developing and disseminating a robust communication toolkit that leaders at all levels can employ to build buy-in among stakeholders and to recruit other leaders to share in the vision. The toolkit should include compelling stories and ongoing case studies that demonstrate what a learning system approach looks like for different roles in the system so that people can envision themselves in that system. Importantly, the toolkit must help leaders tailor their communications to each of their many audiences.
- Leaders in education philanthropy who are committed to the learning system vision should continue to network with each other (e.g., through new partnerships or existing networks, such as the Funders Learning Group for Evidence Use offered by the [Education Funder Strategy Group](#)). Doing so can help coordinate efforts, but it should not constrain innovation or narrow field strategies too early, as multiple sources of knowledge and ideas are critical to building and learning at this stage.



POLICY AND INCENTIVES

A core principle of systems change is that leverage matters. As we work toward a well-aligned legislative, regulatory, and administrative landscape to support a learning system approach in education, we should take advantage of current policies where appropriate to support and maximize the effectiveness of our efforts. Our recommendations thus focus first on finding opportunities within ESSA implementation to reorient a significant portion of federal, state, and even local policies away from an overemphasis on compliance and toward learning and continuous improvement. We then propose an effort to develop a more comprehensive policy framework for learning systems to sustain them over the long term.

RECOMMENDATION 5: Capitalize on ongoing efforts to implement ESSA.

Harness the resources and energy being applied to the implementation of ESSA to begin or advance the shift toward a learning system approach.

From instituting school accountability systems to increasing the effectiveness of teachers and leaders to designing supports for low-performing schools, states and districts implementing ESSA are undertaking multiple changes that could be coupled with efforts to manifest the learning system vision. Further, many key functions of a learning system — continuous improvement, data collection and reporting, use of evidence-based approaches, progress monitoring, and evaluation — are now baked into the law via ESSA. For example, ESSA Title I requires that state plans be “periodically reviewed and revised as necessary.” Title II requires states and districts to “use data and ongoing consultation ... to continually update and improve” their strategies to support teachers and leaders. School improvement plans must incorporate evidence-based interventions. Even waivers under ESSA will not be approved unless the secretary of education determines that the state has presented a sufficient plan to “monitor and regularly evaluate the effectiveness” of the proposal to “ensure ... continuous improvement.”

ESSA implementation thus provides an array of opportunities to embrace a learning system approach. The U.S. Department of Education, state and local education agencies, schools, and organizations supporting ESSA implementation should review their plans and systems to find ways to take advantage of these opportunities. For example, Results for America’s Evidence in Education Lab is supporting state education agencies to take advantage of ESSA’s evidence provisions in multiple ways, such as highlighting [promising practices in state ESSA plans](#) and supporting [State Education Fellows](#) from 13 state education agencies to accelerate the generation and use of evidence to improve student outcomes. Though some efforts like these exist, much more can be done to leverage ongoing ESSA implementation efforts.

Individual leaders and agencies should also identify and capitalize on the opportunities available within their own contexts. State and local education agency membership associations, advocacy organizations, foundations, and technical assistance providers should continue to look for ways to connect their ESSA implementation initiatives to a shared learning system vision. In addition, there is evidence of bipartisan support for such a shift at the federal level.

Here, we share just one example for each level of the system to illustrate the opportunities opened up by ESSA implementation:

- The U.S. Department of Education could anchor its monitoring of ESSA state plans and other grants in continuous improvement and thus encourage state education agencies to shift away from an overemphasis on compliance. Monitoring conversations with state education agencies could center on questions such as: What did you do and why? What have you achieved so far? What have you learned? What will you do differently or better moving forward?
- Because ESSA devolved so much authority to the state level, state education agencies have many opportunities to embrace learning system approaches in their ESSA implementation. For example, as they revise their ESSA plans over time — a learning system routine itself — they can consider how to leverage improvement cycles to catalyze a broader embrace of the learning system approach. In revising accountability systems, state education agencies could choose indicators and weight them to encourage local education agencies and schools to engage in improvement activities. State education agencies must also draw stronger connections — both substantively and rhetorically — from accountability to recognition and support, so that the cultural influence of accountability systems becomes less about shame or punishment and more about aligning supports so that everyone can improve.
- State and local education agencies designing systems of support and improvement for their lowest-performing schools should use data and evidence to develop plans that address the root causes of low performance, and they should build progress-monitoring systems rooted in continuous improvement. For example, rather than simply tracking summative outcomes on an annual basis, states should choose research-based leading indicators and then sequence those measures over the course of a multiyear improvement cycle, leading to exit criteria that are aligned with state accountability requirements.

WHY THIS WORK IS IMPORTANT

There are likely myriad policies and processes at each level of the system that could be redesigned to foster a learning system — so many that some leaders and policymakers may be uncertain where to start or how best to proceed. ESSA implementation provides an opportunity that leaders can use without having to create something from scratch or push against political headwinds. They can start with ESSA, where leverage for change already exists, and then broaden the scope of change.

RECOMMENDATION 6: Develop a learning systems policy framework.

Articulate a set of model policies to help align policies and incentives to an overall vision of a learning system so that policymakers can audit their current policies and revise them where necessary.

Ultimately, we need policymakers to audit their systems' policies beyond ESSA and, where necessary, redesign them to support a learning system approach. Federal agencies are currently doing some of this work, for example, to comply with the requirements of the [Foundations for Evidence-Based Policymaking Act of 2018](#), such as naming chief data officers and developing agency-wide learning agendas. There are also existing policy frameworks that focus on a learning system's individual components, such as the Data Quality Campaign's [policy priorities](#) for data use or Results for America's [recommendations](#) for enacting evidence-based legislation. However, there is not yet a comprehensive framework that can be adapted and adopted in local contexts.

Developing such a framework will require collaboration among a cross-section of policy leaders and practitioners. This group must represent different levels of the system and different parts of the learning system infrastructures. These leaders should first review the legal and regulatory context and crosswalk existing policy recommendations that are aligned with a learning system vision. After identifying what may be missing, the group should draft new proposals to complete the policy framework. Foundations may be well-positioned to support this work, as it represents a discrete investment of resources for a product that would have a wide-reaching impact.

WHY THIS WORK IS IMPORTANT

Policy changes can support the development of key components of the learning system and grant leaders and practitioners the authority and capacity needed to engage in improvement efforts. Notably, policy can elevate priorities on the decision agenda and increase the focus on the shift toward a learning system. Policy can also remove impediments to culture-building and, in some instances, actively contribute to it. (We acknowledge, though, that policy cannot create culture on its own. As more than one interviewee stated, "Culture eats policy for breakfast.")

Further, new incentive structures recommended in a policy framework and implemented with attention to context can drive innovation, research and review, and continuous improvement rather than intentionally or unintentionally discouraging these efforts — and learning mindsets along with them. Finally, a comprehensive policy framework would help create the conditions for acting on the other drivers. For example, the framework could align with the definitions of necessary human capacities (and strategies to cultivate them) to ensure that organizations have people in place with the knowledge, skills, and mindsets to implement specific policies.

Further Efforts to Utilize Policy and Incentives

Additional policy and incentive areas are or will be soon primed for action, and leaders at all levels should look to capitalize on other efforts. For example, beyond complying with the requirements of the Foundations for Evidence-Based Policymaking Act of 2018, how can federal agencies use compliance efforts to advance other aspects of a learning system? As Congress reauthorizes other relevant federal laws (e.g., ESRA, FERPA, or the Individuals with Disabilities Education Act), there will be critical opportunities to smooth the path toward a learning system approach.

Furthermore, once a comprehensive policy frame is articulated, educational institutions — especially state agencies and school districts — should audit their policies, processes, and systems against the framework. Where can they build on existing strengths, and where do they need to fill gaps through new or revised approaches?

Conclusion

The change we seek is significant. The learning system we need will look quite different from the system we currently have. Given our ambitious vision for what is possible, the seven challenges and six recommended actions presented here are just starting points for making this shift. Executing on any of these ideas will require comprehensive plans that, among other things, enumerate specific actions, clarify roles, and identify needed resources. That work lies ahead.

We also know it will take much more work over a longer period to transform the system at all levels. As our and others' efforts unfold, as conditions change, and as the evidence base grows, all of us striving to advance a learning system must be learners ourselves, adjusting our strategies in response to new information.

EducationCounsel and Carnegie Corporation of New York will seek concrete ways to act on these recommendations and support others in doing so. And we will commit to continuing our work to foster dialogue, make connections, and identify and share successes and opportunities for improvement.

Apart from any specific course of action, we hope this paper and our earlier report help stakeholders throughout the education system appreciate the need for a transition to a learning system approach, understand what such a system should look and feel like, recognize the challenges and gaps in our current system, and have confidence that there are steps everyone can take to advance the cause.

References

- Anderson, Kristen Soltis, and Marisa Goldstein. 2015. *Engaging State Legislators: Lessons for the Education Sector*. Washington, D.C.: Aspen Institute.
- Barber, Michael, Paul Kihn, and Andy Moffit. 2011. *Deliverology: From Idea to Implementation*. London: McKinsey.
- Bill & Melinda Gates Foundation and Chan Zuckerberg Initiative. 2018. "[Request for Information for Advanced Education Research & Development Program: Detailed Overview](#)."
- Bill & Melinda Gates Foundation. 2017. "Funders Meeting: Improving School Practice through the Use of Evidence & Research" (PowerPoint presentation). Seattle: Bill & Melinda Gates Foundation.
- Bill & Melinda Gates Foundation. 2019. *Networks for School Improvement: Year One*. Seattle: Bill & Melinda Gates Foundation.
- Breckon, Jonathan. 2016. *Using Research Evidence: A Practice Guide*. London: Alliance for Useful Evidence.
- Breckon, Jonathan, and Jane Dodson. 2016. *Using Evidence: What Works?* London: Alliance for Useful Evidence.
- Bryk, Anthony S. 2017. *Redressing Inequities: An Aspiration in Search of a Method*. Palo Alto, CA: Carnegie Foundation for the Advancement of Teaching.
- Bryk, Anthony S., Louis M. Gomez, Alicia Grunow, and Paul G. LeMahieu. 2015. *Learning to Improve: How America's Schools Can Get Better at Getting Better*. Cambridge, MA: Harvard Education Press.
- Carnegie Foundation for the Advancement of Teaching. 2017. [How a Networked Improvement Community Improved Success Rates for Struggling College Math Students](#). Palo Alto, CA: Carnegie Foundation for the Advancement of Teaching.
- Chiefs for Change. 2016. [Policy Brief: ESSA and Evidence: Why It Matters](#). Washington, D.C.: Chiefs for Change.
- Cobb, Paul, Kara Jackson, Thomas Smith, Michael Sorum, and Erin Henrick. 2013. "[Design Research with Educational Systems: Investigating and Supporting Improvements in the Quality of Mathematics Teaching and Learning at Scale](#)." *Yearbook of the National Society for the Study of Education* 112, no. 2, 320–349.
- Coburn, Cynthia E., William R. Penuel, and Kimberly Geil. 2012. *Research-Practice Partnerships: A Strategy for Leveraging Research for Educational Improvement in School Districts*. New York: William T. Grant Foundation.
- Commission on Evidence-Based Policymaking. 2017. *The Promise of Evidence-Based Policymaking*. Washington, D.C.: Commission on Evidence-Based Policymaking.
- Daly, Alan J. 2014. *Organizational Network Mapping: Case Study: Solution Design*. Culture Optix.
- Data Quality Campaign. 2016. [Student Data Privacy Legislation: A Summary of 2016 State Legislation](#). Washington, D.C.: Data Quality Campaign.
- Data Quality Campaign. 2017a. [From Hammer to Flashlight: A Decade of Data in Education](#). Washington, D.C.: Data Quality Campaign.
- Data Quality Campaign. 2017b. [Show Me the Data: States Can Improve Report Cards This Year](#). Washington, D.C.: Data Quality Campaign.
- Data Quality Campaign. 2018. [Time to Act: Using Data to Meet ESSA Goals](#). Washington, D.C.: Data Quality Campaign.
- Dolan, W. Patrick. 1994. *Restructuring Our Schools: A Primer on Systemic Change*. Kansas City, MO: Systems & Organization.
- DuMont, Kim. 2015. [Leveraging Knowledge: Taking Stock of the William T. Grant Foundation's Use of Research Evidence Grants Portfolio](#). New York: William T. Grant Foundation.
- Farrell, Caitlin C., Kristen L. Davidson, Melia Repko-Erwin, William R. Penuel, Corinne Herlihy, Ashley Seidel Potvin, and Heather C. Hill. 2017. [A Descriptive Study of the IES Research-Practitioner Partnerships in Education Research Program](#) (Technical Report No. 2). Boulder, CO: National Center for Research in Policy and Practice.
- Feuer, Michael J. 2016. *The Rising Price of Objectivity: Philanthropy, Government, and the Future of Education Research*. Cambridge, MA: Harvard Education Press.
- Finnigan, Kara S., Alan J. Daly, and Jing Che. 2013. "Systemwide Reform in Districts Under Pressure: The Role of Special Networks in Defining, Acquiring, Using, and Diffusing Research Evidence." *Journal of Educational Administration* 51, no. 4 (June): 476–497.
- Finnigan, Kara S., and Alan J. Daly. 2017. "[The Trust Gap: Understanding the Effects of Leadership Churn in School Districts](#)." *American Educator* 41, no. 2 (Summer): 24–29, 43.
- Franks, Alison. 2017. "Knowledge Sharing Analysis" (Draft document for Carnegie Corporation of New York). October 2017.

- Ginsburg, Alan, and Marshall S. Smith. 2016. [*Do Randomized Controlled Trials Meet the “Gold Standard”? A Study of the Usefulness of RCTs in the What Works Clearinghouse*](#). Washington, D.C.: American Enterprise Institute.
- Gordon, Dan. 2017. *Convening on Continuous Improvement in Education: Summary of Key Points and Takeaways*. Washington, D.C.: EducationCounsel.
- Gordon, Dan, Scott Palmer, and Sean Darling-Hammond. 2019. [*Transforming the Education Sector into a Learning System: Harnessing the Power of Continuous Improvement, Research & Development, and Data to Improve Outcomes for Each and Every Child*](#). Washington, D.C.: EducationCounsel.
- Government Accountability Office. 2013. [*Education Research: Further Improvements Needed to Ensure Relevance and Assess Dissemination Efforts*](#) (Report to the Committee on Education and the Workforce, House of Representatives). Washington, D.C.: Government Accountability Office.
- Hargreaves, Andy, and Michael Fullan. 2012. *Professional Capital: Transforming Teaching in Every School*. New York: Teachers College Press.
- Hochleitner, Taryn. 2019. “#DataPrivacyDay.” *Data Quality Campaign Blog*. January 28, 2019. <https://dataqualitycampaign.org/dataprivacyday2019/>.
- Honig, Meredith I., Nitya Venkateswaran, and Patricia McNeil. 2017. “Research Use as Learning: The Case of Fundamental Change in School District Central Offices.” *American Educational Research Journal* 54, no. 5 (October): 938–971.
- Hopkins, Megan, James P. Spillane, Paula Jakopovic, and Ruth M. Heaton. 2013. “Infrastructure Design and Instructional Reform in Mathematics: Formal Structure and Teacher Leadership.” *Elementary School Journal* 114, no. 2 (December): 200–224.
- Hopkins, Megan, and James P. Spillane. 2015. “Conceptualizing Relations between Instructional Guidance Infrastructure (IGI) and Teachers’ Beliefs about Mathematics Instruction: Regulatory, Normative, and Cultural-Cognitive Considerations.” *Journal of Educational Change* 16 (October): 421–450.
- Institute of Education Sciences and National Science Foundation. 2013. [*Common Guidelines for Education Research and Development*](#). Washington, D.C.: Institute of Education Sciences and National Science Foundation.
- Jensen, Ben, Julie Sonnemann, Katie Roberts-Hull, and Amélie Hunter. 2016. [*Beyond PD: Teacher Professional Learning in High-Performing Systems*](#). Washington, D.C.: National Center on Education and the Economy.
- Jones, Stephanie, Camille A. Farrington, Robert Jagers, and Mark Brackett, with Jennifer Kahn. 2019. [*National Commission on Social, Emotional, and Academic Development: A Research Agenda for the Next Generation*](#). Washington, D.C.: Aspen Institute.
- Kania, John, Mark Kramer, and Peter Senge. 2018. [*The Water of Systems Change*](#). Boston: FSG.
- Kotter, John P. 2012. [*“Accelerate! How the Most Innovative Companies Capitalize on Today’s Rapid-Fire Strategic Challenges — And Still Make Their Numbers.”*](#) *Harvard Business Review*, November 2012 (Reprint R1211B).
- LeMahieu, Paul G., Anthony S. Bryk, Alicia Grunow, and Louis M. Gomez. 2017. “Working to Improve: Seven Approaches to Improvement Science in Education.” *Quality Assurance in Education* 25, no. 1 (February): 2–4.
- Meadows, Donella. 1999. [*Leverage Points for Places to Intervene in a System*](#). Hartland, VT: Sustainability Institute.
- Mehta, Jal, Robert B. Schwartz, and Frederick M. Hess (Eds). 2012. *The Futures of School Reform*. Cambridge, MA: Harvard Education Press.
- Moffitt, Susan L., Heather C. Hill, and David K. Cohen. 2016. “Suggestions to Support Instructional Improvement through ESSA” (memorandum).
- National Center for Research in Policy and Practice. 2015. [*Findings from a Survey of Research Attitudes and Use in the Nation’s Largest Districts*](#). Boulder, CO: National Center for Research in Policy and Practice.
- National Research Council. 2003. *Strategic Education Research Partnership*. Washington, D.C.: National Academies Press.
- National Research Council. 2012. [*Using Science as Evidence in Public Policy*](#). Washington, D.C.: National Academies Press.
- Nelson, Steven R., James C. Leffler, and Barbara A. Hansen. 2009. [*Toward a Research Agenda for Understanding and Improving the Use of Research Evidence*](#) (Final Report to the William T. Grant Foundation). Portland, OR: Northwest Regional Educational Laboratory.
- Norman, Jon. March 2017. [*Pathways Post-Participation Outcomes: Preliminary Findings*](#). Palo Alto, CA: Carnegie Foundation for the Advancement of Teaching.
- O’Day, Jennifer A., and Marshall S. Smith. 2016. [*“Quality and Equality in American Education: Systemic Problems, Systemic Solutions.”*](#) In *The Dynamics of Opportunity in America*, edited by Irwin Kirsch and Henry Braun, 297–358. Princeton, NJ: Educational Testing Service.
- Park, Sandra, Stephanie Hironaka, Penny Carver, and Lee Nordstrum. 2013. [*Continuous Improvement in Education*](#). Palo Alto, CA: Carnegie Foundation for the Advancement of Teaching.
- Penn Hill Group. 2015. *The Aspen Senior Congressional Education Staff Network: An Analysis*. Washington, D.C.: Penn Hill Group.
- Penuel, William R., Derek C. Briggs, Kristen L. Davidson, Corinne Herlihy, David Sherer, Heather C. Hill, Caitlin C. Farrell, and Anna-Ruth Allen. 2016. [*Findings from a National Survey of Research Use among School and District Leaders*](#) (Technical Report No. 1). Boulder, CO: National Center for Research in Policy and Practice.
- Penuel, William R., and Daniel J. Gallagher. 2017. *Creating Research-Practice Partnerships in Education*. Cambridge, MA: Harvard Education Press.
- Petrides, Lisa A., and Thad R. Nodine. 2003. [*Knowledge Management in Education: Defining the Landscape*](#). Half Moon Bay, CA: Institute for the Study of Knowledge Management in Education.
- Results for America. 2017. [*ESSA Leverage Points: 64 Promising Practices from States for Using Evidence to Improve Student Outcomes*](#). Washington, D.C.: Results for America.
- Results for America and the Council of Chief State School Officers. 2017. [*Leverage Points: Thirteen Opportunities for State Education Agencies to Use Their ESSA State Plans to Build and Use Evidence to Improve Student Outcomes*](#). Washington, D.C.: Results for America.
- Rogers, Everett M. 1962. *Diffusion of Innovation Theory*. New York: Free Press of Glencoe.

Service, Owain, Michael Hallsworth, David Halpern, Felicity Algate, Rory Gallagher, Sam Nguyen, Simon Ruda, and Michael Sanders, with Marcos Pelenur, Alex Gyani, Hugo Harper, Joanne Reinhard, and Elspeth Kirkman. 2016. [EAST: Four Simple Ways to Apply Behavioural Insights](#). London: Behavioural Insights Team.

Spillane, James P., Megan Hopkins, and Tracy M. Sweet. 2017. "School District Educational Infrastructure and Change at Scale: Teacher Peer Interactions and Their Beliefs about Mathematics Instruction." *American Educational Research Journal* 55, no. 3 (December): 532–571.

Srinivasan, LaVerne, and Jeff Archer. 2018. *From Fragmentation to Coherence: How More Integrative Ways of Working Could Accelerate Improvement and Progress toward Equity in Education*. New York: Carnegie Corporation of New York.

Tseng, Vivian. 2012. "[The Uses of Research in Policy and Practice](#)." *Social Policy Report* 26, no. 2 (Summer): 1–24.

Tseng, Vivian, and Sandra Nutley. 2014. "[Building the Infrastructure to Improve the Use and Usefulness of Research in Education](#)." In *Using Research Evidence in Education: From the Schoolhouse Door to Capitol Hill*, edited by Kara S. Finnigan and Alan J. Daly, 163–175. Switzerland: Springer.

William T. Grant Foundation. 2016. [From Data to Evidence to Policy: Recommendations for the Commission on Evidence-Based Policymaking](#). New York: William T. Grant Foundation.

Willingham, Daniel T. 2012. *When Can You Trust the Experts? How to Tell Good Science from Bad in Education*. San Francisco: Jossey-Bass.