A Blueprint for the Future of the Federal Role in K-12 Education R&D

Alliance For Learning Innovation

Learning Systems Leadership Network

InnovateEDU®

Time to Act for Our Shared Future

The national security of the United States is underpinned by its technological and economic competitiveness and the talent that fuels it. We must ensure that we are preparing our students for the future to maintain our competitive edge in innovation.

Today, the United States faces new challenges, focusing national attention on the need to improve education and ensure that all students are equipped to achieve at the highest levels. Global conflicts and the rise of China have renewed concerns about American competitiveness. New technologies, such as artificial intelligence (AI) and quantum computing, are transforming how we learn, teach, and work. Over the next five years, nearly 40% of current skills may become obsolete, and approximately 60% of workers will require retraining.

What is Education R&D?

The Alliance for Learning Innovation defines education R&D as applied research in real-world education environments focused on developing, testing, evaluating, and improving innovative solutions—tools, products, features, systems, or policies—to our nation's most pressing education problems.

Unlocking Solutions Through Education R&D

Without a stronger education system capable of promoting student achievement and success, our future is at risk. To improve how students learn and give them opportunities to succeed, we must understand how to answer three fundamental questions: ***What works? For whom? And under what conditions?***

Education research and development (ed R&D) is key to an education system that is responsive to these questions and the needs of students, educators, and families in a modern world. Ed R&D can enable breakthrough technologies, new pedagogical approaches, innovative learning models, and more efficient and valid forms of measurement of student learning, experiences, and opportunities.

While federal spending on education research has helped us learn far more about how students grow, think, and succeed, it has often failed to deliver the practical tools and clear answers that states, districts, and communities need. Instead of fast, focused solutions, the system has struggled with national coordination, investment prioritization, and the speed of translation. Valuable insights are left unused while students, families, and employers wait for real results.

A future federal ed R&D system must start with clear goals and identify the real problems holding students back, and lay out a direct path to better results. Every student should be actively engaged in learning, taught to think critically and independently, and prepared to succeed in the workforce and in life.

In a letter to Michael Kratsios, Director of the Office of Science and Technology Policy, President Trump called upon him to accelerate R&D and invest in "new paradigms of research enterprise" to fuel economic growth and better the lives of all Americans. Government investments in scientific R&D have yielded 150% to 300% returns, and this return on investment is equally possible for ed R&D.

We must not see ed R&D as a cost, but as an investment in our children's future and necessary for our shared prosperity.

A Call to Action

Through a collaborative process, nearly 150 bipartisan and cross-sector participants representing education, academia, industry, and policymakers crafted a new blueprint for a reimagined federal education R&D infrastructure. The field is aligned around the fact that only the federal government can sustainably fund, at scale, ed R&D that will drive student outcomes. The blueprint includes a set of high-level design principles that should characterize ed R&D infrastructure, the functions that the federal ed R&D infrastructure must perform, and the conditions that must be in place for the infrastructure to deliver successful outcomes.

Key Federal Education R&D Functions

Invest in Research & Innovation

The federal government is the only entity that can invest in the full spectrum of R&D, from longitudinal research on student learning, evaluating how effectively federal education funds are being used, to supporting entrepreneurs in scaling their evidence-based education tools. The federal government should leverage its unique position to invest in ed R&D that develops and scales cutting-edge approaches and tools—including AI and language models—through rapid-cycle innovation processes that address real-world challenges, stimulate market competition, and ultimately benefit student learning outcomes.

Empower State and Local Leaders

The federal government must understand and respond to the needs of state education leaders, utilizing its resources to collaborate with state and local leaders and address their most pressing questions. This collaboration will enable them to identify and implement effective strategies that support their education goals.

Collect and Analyze Meaningful Data

High-quality, interoperable, and timely data underlie all R&D efforts. For an effective ed R&D system, the federal government must collect and measure data that tells us about the condition of education and what works to improve it. The federal government is uniquely positioned to collect and publish this information, enabling comparisons across states and sectors.

Functions

#1 Invest in Research

Only the federal government has the resources and reach to fund large-scale education research that provides state and local school leaders with evidence about what improves student achievement. Federally supported education research should address the challenges that states and districts identify, like lagging math and literacy achievement, workforce preparedness, and special education.

The federal government should require that federally funded ed R&D involve communities and educators from the start. This means that researchers involve end users—such as students, parents, and educators—in formulating questions, designing the research process, collecting data, and ultimately communicating the findings.

Currently, the federal government makes R&D investments across multiple federal agencies (e.g., National Science Foundation, National Institutes of Health, Institute of Education Sciences) that can fuel educational progress. It has a responsibility to connect research insights across those silos to grow the knowledge base of what works for students and put it in action.

#2 Invest in Innovation

The federal government is uniquely positioned to invest in the development side of R&D, investing in and helping scale cutting-edge educational tools and approaches. With the advent of high-performing large language models and other advancements in artificial intelligence, the federal government should invest in bold ideas that apply these emerging technologies to advance student success and America's learning environments.

Federal ed R&D should include rapid-cycle development and commercialization efforts, focusing on solving significant, real-world challenges. Federal investments in these innovations can stimulate market competition and encourage the development of new technologies that benefit students and support their learning.

#3 Empower State and Local Leaders to Innovate and Improve

The federal government plays a pivotal role in collaborating with and supporting state and local education leaders to know and do what works in education.

Throughout the entire ed R&D process, states can benefit from the federal government's capacity, expertise, and resources. The federal government can collaborate with state partners to produce evidence-based education policies and interventions tailored to each state's context and scale bright spots, ultimately improving student outcomes.

In partnership with state and local leaders, the federal government should develop plain-language, research-based resources on what works for specific children and in particular contexts. These resources should be tailored to different audiences, allowing states, districts, schools, educators, and families to find relevant information to make informed decisions.

Cross-Cutting Function: Collect and Measure What Matters

High-quality, interoperable, and timely data is the bedrock of the R&D sector and evidence-based policymaking. Within education, the aggregation, synthesis, and sharing of insights are essential for knowing the condition of our students and schools, including academic performance, access to learning environments, and workforce outcomes. Data is cross-cutting and fuels education R&D; it is a source of transparency and accountability.

Cross-Cutting Function: Collect and Measure What Matters (Continued)

The federal government must:

→ Track data over time and across states and sectors to provide leaders with a wide breadth and depth of insights about how their students are performing, including relative to others across the country and the world;

→ Measure what matters on widely shared priorities (e.g., increasing academic achievement in literacy and math, encouraging return on investment for government-funded interventions, etc.), and use those measurements to understand whether government-funded R&D is working;

→ Upgrade data systems and ensure they are secure and interoperable across sectors (i.e., early education, K-12, higher education, and workforce);

→ Reduce red tape for states and districts reporting information to the federal government; and

→ Protect students' privacy as a paramount priority.

Principles

Effective ed R&D would require the federal government to use the following principles in the design of grants, contracts, and technical assistance.

Responsive and Iterative

Ed R&D should create feedback loops where educators, researchers, and policymakers collaborate continuously. This means regularly collecting real-world results, quickly adapting approaches based on what works, and involving the people who matter most—educators, students, and families—from the outset of any research project. Good research doesn't happen in isolation; it thrives when experts in learning environments help shape the questions and make meaning of the answers.

Scalability and Usability

R&D should address real-world problems in partnership with local communities and be replicable and scalable outside of a "lab" context. To produce relevant and timely information, the federal government should value a range of research methods, taking care to balance the urgency of solving a problem with the rigor of science. Education interventions are not one-size-fits-all, so research results should be shared based on what's "likely to work" given the context, allowing local education leaders and families to make informed choices and scale bright spots to new environments.

Public-Private Partnership

Partnering with industry and academia can maximize interdisciplinary expertise and resources, helping researchers and innovators successfully scale their work when there might otherwise be a market gap.

Federalism and State Leadership

State and local education leaders are best equipped to understand their constituents' needs and should set ed R&D goals accordingly. The federal government's role is to ensure these leaders have the knowledge, capacity, and resources they need to meet those goals.

Conditions for Success

For the federal government to successfully execute any of these ed R&D functions, it must have the necessary capacity, sufficient resources, strong leadership, and enabling policies. Specifically, this includes:

→ Talent

Successful ed R&D requires robust talent pipelines in and outside of government to organize and deploy high-quality research efforts. Outside of government, education researchers and innovators need pathways to sustainable careers in ed R&D. Federal agencies must also have the internal talent and staffing with the skills needed to achieve their mission. Within ed R&D, federal teams must include experts in education research and policy, models of R&D, and government innovation processes. This constellation of expertise can be created through a combination of civil service talent and by leveraging public-private partnerships to draw on experts across sectors (e.g., via the Intergovernmental Personnel Act, cooperative agreements, etc.).

→ Data Governance

The federal government must have policies, processes, and personnel that foster the public's trust in the collection and use of data while ensuring security and privacy.

→ Procurement

The federal government's purchasing power is one of its greatest assets. When engaging in R&D, federal teams require the flexibility to pursue various procurement strategies (e.g., prize challenges, advance market commitments) to achieve different R&D objectives. These flexibilities can stimulate market competition and ensure federal teams have the tools they need to deliver better services to taxpayers.

→ Interagency Cooperation

When federal agencies work together, they can approach problems from their divergent sources of expertise. That can lead to powerful solutions that often don't happen in silos. Agencies require strong and timely data sharing, analysis, and shared decision-making, such as between the Department of Education, the National Science Foundation, and the National Institutes of Health.

→ Authorization and Funding

Ultimately, the federal government must provide support, in the form of sufficient infrastructure and programs, staffing, and financial resources, to execute its R&D and data responsibilities.

Learn more about the future of federal education R&D:

Thank you to the many writers, collaborators, and editors who contributed to this blueprint.

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