Alliance For Learning Innovation

Learning Systems Leadership Network

InnovateEDU

A Report from the Future of Federal K12 Education R&D Taskforce

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Introduction

What is Education R&D?

This blueprint defines 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.

In the landmark 1983 report, "A Nation At Risk," the authors assured the U.S. Secretary of Education that "the American people, properly informed, will do what is right for their children and for the generations to come." Today, faced with a proliferation of technologies, tools, curricula, and school models, the seemingly simple task of staying "properly informed" about what works in education is daunting.

To address this challenge, the federal government invested in and developed an infrastructure for education research and development (ed R&D). This federal ed R&D infrastructure aims to answer three fundamental questions: What works? For whom? Under what conditions? And thanks to those federal ed R&D investments, we know *far* more about how students learn, what motivates them, and what allows them to flourish than we did four decades ago. These insights into how children learn weren't inevitable—they emerged through sustained funding, robust interagency partnerships, and support for state education leaders.

Take, for example, the Science of Reading.[1] In 1997, Congress convened the National Reading Panel,[2] a partnership between the National Institutes of Health (NIH) and the Department of Education (ED) to conduct a comprehensive, interdisciplinary literature review of evidence-based methods for teaching children to read. In 2000, the Panel concluded that a combination of practices, including phonics-based instruction, is the gold standard for literacy instruction.

In 2013, Mississippi passed the Literacy-Based Promotion Act, requiring K-3 educators to be trained in research-based instructional practices for literacy, built upon the same practices outlined in the National Reading Panel's results.[3] In applying the Science of Reading, Mississippi Superintendent Dr. Carey Wright formed a deep partnership with the Institute

[1] https://www.alicoalition.org/success-story/how-state-and-federal-rd-investments-helped-make-the-mississippi-miracle-possible/

[2] https://www.nichd.nih.gov/research/supported/nrp

[3] https://www.edweek.org/teaching-learning/mississippi-students-surged-in-reading-over-the-last-decade-heres-how-schools-got-them-there/2023/06

of Education Sciences (IES) to evaluate the state's progress in implementing its literacy efforts. The results that followed were staggering: Mississippi went from 49th in reading outcomes to 21st, improving the lives of a generation of children.

Mississippi's dramatic improvement sends a powerful message: if the nation wants an education system that fosters a productive workforce and citizenry, then it needs a federal education research and development infrastructure that can help identify and respond to grand challenges in education, including those in literacy, math, and workforce preparedness. America needs a federal ed R&D system connected to practice and policy that prioritizes real-world impact, supporting educators and state leaders in finding answers to pressing questions, understanding what works for their students, and adopting proven solutions.

While the "Mississippi Miracle"[4] demonstrates the potential impact of federally supported, evidence-based education policy, we now face unprecedented technological change that demands an even more responsive R&D approach. New technologies, such as generative AI and the rise of quantum computing, are transforming how we learn, teach, and work. In the next five years, nearly 40% of current skills may be obsolete, and nearly 60% of workers will need retraining.[5] These emerging technologies create unprecedented opportunities to understand and support American students, including by providing richer data that enables educators to assess students' progress and tailor interventions to their individual learning needs. Fortunately, the federal ed R&D infrastructure also invests in developing new technologies, learning models, and solutions. Government-funded and -scaled evidence-based technologies such as ASSISTments[6] and BirdBrain[7] are enabling educators and students to engage in hands-on learning both inside and outside the classroom.

In a letter to Michael Kratsios,[8] Director of the Office of Science and Technology Policy, President Trump describes how in the 1940s, Dr. Vannevar Bush "laid the groundwork for

[4] https://www.alicoalition.org/success-story/how-state-and-federal-rd-investments-helped-make-the-mississippi-miracle-possible/

[5] https://reports.weforum.org/docs/WEF_Future_of_Jobs_Report_2025.pdf

[6] https://www.alicoalition.org/success-story/from-question-to-impact-the-assistments-story/

[7] https://www.alicoalition.org/success-story/turning-research-into-a-viable-ed-tech-company-with-federal-support/

[8] https://www.whitehouse.gov/briefings-statements/2025/03/a-letter-to-michael-kratsios-director-of-the-white-house-office-of-science-and-technology-policy/

the uniquely successful American partnership of Government, industry, and academia that built the greatest and most productive nation in human history." Since then, government investments in scientific R&D have yielded 150% to 300% returns.[9] At the same time, federal ed R&D infrastructure has historically struggled with national coordination, investment prioritization, and the speed of translation, leaving results on the table that could otherwise benefit our students.

A set of focused, deliberate, and coordinated federal investments in ed R&D can yield the same results for our nation's children.

Through a collaborative process, nearly 150 cross-sector participants within ed R&D crafted a new blueprint for a reimagined federal ed R&D infrastructure. The field is aligned around the fact that only the federal government can sustainably fund, at scale, education 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.

The key functions of federal ed R&D must include:

- 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 and local education leaders, utilizing its resources to collaborate and address their most pressing questions. This collaboration will enable states and local leaders to identify and implement effective strategies that support their education goals.

[9] https://www.dallasfed.org/research/papers/2023/wp2305

- 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 reveals 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.

View the Blueprint for the Future of Federal K12 Education at www.alicoalition.org/future.

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.

The federal government must:

- Develop research priorities collaboratively. In order to identify the urgent nationwide challenges that will benefit from R&D, the federal government must determine priorities in partnership with state, territorial, tribal, and local governments. Decisions about what research to fund must include input from communities and the field to ensure it benefits the intended audience.

- Drive research to solve education and workforce challenges. Federally supported education research should primarily address urgent nationwide challenges like literacy, math, and high ROI career pathways. By focusing federal dollars on research that will solve real-world challenges and bolster U.S. competitiveness, the government acts as a responsible steward of taxpayer funds. When the federal government leads research in areas of national need, states can focus their resources on the context-specific needs facing their students and communities.

Policy recommendations:

FOR CONGRESS

- Provide sufficient resources for research across agencies. Education research and development aligned with areas of national need happens across many federal agencies, including but not limited to the U.S. Department of Education (ED), National Science Foundation (NSF), U.S. Department of Defense, and U.S. Department of Health and Human Services. Sufficient resources must be allocated to each agency to allow them to fulfill their missions while also addressing areas of national need, like STEM literacy and workforce development. In particular, Congress should fund IES, NSF's STEM Education and Technology, Innovation, and Partnership Directorates, and ED's Education Innovation and Research grants at levels as close to Fiscal Year 2024 as possible.

- Prioritize funding for R&D activities that respond to community and practitioner needs. When considering new education and R&D initiatives, Congress should prioritize programs or R&D models that foster more collaborative approaches, such as conducting outreach to and engaging with practice or community partners throughout a proposed project via Statewide Systemic Initiatives or Research-Practice Partnerships (discussed further in "Empower State and Local Leaders to Innovate and Improve"). This also includes sustained support for state- and community-facing programs authorized in the Education Sciences Reform Act.

- Fund the Centers for Transformative Education Research and Translation (CTERT)[10]. As part of the CHIPS and Science Act, Congress authorized these multidisciplinary centers housed at NSF to support R&D on widespread and sustained implementation of STEM education innovations.[11] While this work has begun as the Discovery Research PreK-12 Program Resource Center on Transformative Education Research and Translation (DRK-12 RC), appropriating funding for CTERT would be a down payment on America's next generation and global competitiveness.

FOR THE ADMINISTRATION

- Create a national education research agenda to address the most pressing problems of practice. Federal education R&D leaders should work with state and

[10] https://www.alicoalition.org/publications/centers-for-transformative-education-research-and-translation/

[11] https://www.congress.gov/bill/117th-congress/house-bill/4346

local entities to create a cohesive national research agenda that directs investment in critical areas of focus and drives progress on the Secretary of Education's policy priorities.[12] This agenda should be developed with state and local input and address challenges communities face across education's pressing problems of practice.[13] In practice, this could look like a group of interagency leaders from agencies like IES, NSF, and others co-designing and co-developing research questions with state education agency (SEA) and local education agency (LEA) leaders and community members on a recurring four-year basis to ensure research and evidence are relevant and timely and that funding is being strategically deployed throughout basic and applied research, as well as development efforts.

- Incentivize researchers to partner with state and local education leaders. Federal education research grants should prioritize proposals that have a plan for engaging SEAs and LEAs, parents, and other community stakeholders throughout the R&D process. Federal grantmakers within NSF, IES, and other agencies working on education topics should stipulate that research design must include input from these stakeholders, and be able to demonstrate that the work will meet the needs of state and local leaders, and that they will be engaged as partners consistently through the research.

- Coordinate and leverage research conducted across all federal agencies. Research investments are made across several science agencies that can benefit student achievement and boost learning outcomes. Ed R&D infrastructure should leverage work done at NSF and NIH as major drivers of basic research, with IES and other agencies focusing on complementary R&D activities, in terms of research areas or models. As mentioned above, a group of interagency leaders should convene to oversee the development of a national education research agenda and publish the research priorities regularly.

- Fund regular evidence reviews. There is already a corpus of information about what we know about education best practices, but the utilization of that knowledge, historically, has not been prioritized. Efforts like the National Reading Panel[14]

[12] https://www.federalregister.gov/documents/2025/05/21/2025-09093/proposed-priorities-and-definitions-secretarys-supplemental-priorities-and-definitions-on

[13] https://www.alicoalition.org/publications/pressing-problems-of-practice-facing-us-education/

[14] https://www.nichd.nih.gov/sites/default/files/publications/pubs/nrp/Documents/report.pdf

demonstrate the value of concerted efforts to review results of investments from NSF, NIH, and philanthropy, make sense of the current evidence base, and publish the current state of evidence on a particular topic that is accessible, digestible, and actionable by the field. In partnership with the NIH, NSF, and other research agencies, IES should aim to replicate the National Reading Panel effort in other areas of research with an emphasis on translating knowledge into actionable insights for state and local education leaders.

- Evaluate the efficacy of ed R&D investments. IES should evaluate federally funded R&D programs for their effectiveness in improving student outcomes and increasing returns to taxpayers. IES should consider using pay-for-success models[15] and outcomes-based contracting[16] more frequently across key programs to ensure that there is a clear return on investment (ROI). Evaluation provides transparency to the public, ensures ineffective education R&D investments are reformed or eliminated, and identifies bright spots that can be scaled.

[15] https://socialfinance.org/what-is-pay-for-success/
[16] https://obc.southerneducation.org/

Invest In Innovation

In a March 26, 2025 letter from President Trump to the Director of the White House Office of Science and Technology Policy, the president wrote, "We need new paradigms for the research enterprise, including innovative models for funding and sharing scientific research, redefining how America conducts the business of discovery."[17]

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. At the request of Congress, IES had recently begun to support more ed R&D of this nature through programs like the Accelerate, Transform, and Scale (ATS) Initiative, which was designed to facilitate Advanced Research Projects Agency (ARPA)-inspired, interdisciplinary R&D to address America's most pressing education challenges.

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.

The federal government must:

- Invest in high-potential, high-impact R&D. The government has a vital role to play in funding R&D that serves as a bridge between basic research and commercially viable products. Industry tends to invest in short-term, profit-driven R&D projects, neglecting the types of bold "what if?" ideas that could lead to breakthroughs in teaching and learning. Through coordinated research programs, the federal government can seed innovations that hold promise but are not yet ready for the market.[18]

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[17] https://www.whitehouse.gov/briefings-statements/2025/03/a-letter-to-michael-kratsios-director-of-the-white-house-office-of-science-and-technology-policy/

[18] https://ies.ed.gov/funding/research/programs/small-business-innovation-research-sbir

- Build interagency and public-private partnerships. Industry, philanthropy, and the public sector all have a role to play in supporting K-12 education R&D. When they join forces, they can leverage their unique assets to accelerate the pace and impact of innovation. Similarly, when agencies coordinate and combine their capacity and resources, they can fuel meaningful progress on large-scale challenges.

Policy recommendations:

FOR CONGRESS

- Authorize and fund an ARPA for education. The federal government invests in ARPA-inspired, interdisciplinary research and development that builds on the existing research base to address America's greatest societal challenges. DARPA drives technical innovation to strengthen national security and prevent "technical surprise" by foreign adversaries.[19] ARPA-H accelerates better health outcomes for all Americans.[20] Given the many challenges U.S. schools face, from chronic absenteeism to lagging National Assessment of Educational Progress (NAEP) scores, the federal government should make a comparable investment in an ARPA for education. Its "grand challenges" should be informed by state and local governments alongside school leaders. This model would enable and unleash the rapid development of powerful and effective innovations and ensure effective learning experiences make it to market, scale faster, and at a higher quality.

- Fund robust federal investments in AI and emerging technologies. Specifically, grow the National AI Institutes program at NSF[21] and the Accelerate, Transform, & Scale Initiative (ATS) at IES.[22] NSF and IES co-funded the AI Institute for Exceptional Education,[23] which capitalizes on the latest AI research to serve children with speech and language pathology needs, as well as the AI Institute for Inclusive Intelligent Technologies for Education,[24] exploring the intersection of AI and skills, like persistence and collaboration that underlie academic success. Communities would benefit from additional AI Institutes that meet the moment and deliver solutions for today's teaching and learning challenges. Congress should also continue to fund the

[19] https://www.darpa.mil/about
[20] https://arpa-h.gov/about
[21] https://new.nsf.gov/funding/opportunities/national-artificial-intelligence-research-institutes
[22] https://ies.ed.gov/ats-initiative/
[23] https://www.buffalo.edu/ai4exceptionaled.html
[24] https://invite.illinois.edu/

ATS Initiative at IES to support more U-GAIN R&D Centers,[25] which provide rapid and responsive research around generative AI in schools and classrooms. To facilitate the type of rapid-cycle R&D needed for emergent and fast-moving technologies, the government should partner with the private sector and organizations to develop and support a national testing and trialing infrastructure for educational technologies and interventions, enabling states and districts to host "testbeds" for innovation and rapid-cycle research and development.

FOR THE ADMINISTRATION

- Leverage innovative funding mechanisms to spark breakthroughs. In an April 2025 speech,[26] OSTP Director Michael Kratsios asserted, “Prizes, advance market commitments, and other novel funding mechanisms, like fast and flexible grants, can multiply the impact of government-funded research." While traditional grants have been the mainstay of federally supported education R&D, there have been recent efforts to try out more novel approaches. For instance, IES sponsored a $1M XPrize Digital Learning Challenge, which resulted in new “systems to conduct rapid, reproducible experiments” that “improve our understanding of what works in education, while saving time and improving learning outcomes for millions of students.”[27] Through Small Business Innovation Research Grants (SBIR), advanced market commitments, and other similar mechanisms, the federal government can strategically deploy dollars to innovators and researchers tackling complex, urgent issues in education.[28] [29]

- Accelerate innovation through models of public-private partnership. In partnership with the private sector, agencies engaged in ed R&D should also double down on market-shaping mechanisms that help stimulate industry engagement in scaling evidence-based tools and strategies. Private sector models to draw inspiration from include the defense and intelligence sectors’ collaboration with In-Q-TEL,[30]

[25] https://ies.ed.gov/blogs/research/post/accelerating-research-on-generative-artificial-intelligence-ies-announces-four-new-research-and-development-centers?utm_medium=email&utm_source=newsflash

[26] https://www.whitehouse.gov/articles/2025/04/remarks-by-director-kratsios-at-the-endless-frontiers-retreat/

[27] https://www.xprize.org/challenge/digitallearning

[28] https://ies.ed.gov/funding/research/programs/small-business-innovation-research-sbir

[29] https://www.alicoalition.org/publications/alliance-for-learning-innovation-2025-policy-agenda-congress/

[30] https://www.iqt.org/

demonstrating how a well-positioned intermediary can efficiently align technical expertise to public interest issues that the market would not otherwise solve. Open Technology Fund demonstrates similar potential with non-profit partners, as a model that facilitates the marketplace for public interest missions.[31] The Trump administration's emphasis on public-private partnerships, as seen in its executive order on Advancing Artificial Intelligence Education for American Youth,[32] will allow the ed R&D enterprise to pursue its goals at a pace that more closely matches the economy around it.

- Measure the ROI of ed R&D interventions. IES and other research agencies should prioritize infrastructure that enables more transparency around education R&D funding. This will not only benefit taxpayers but also ensure that ineffective investments are reformed or eliminated. Investments with a high ROI should be supported to scale up and reach more students. ED and other agencies should require regular updates and project summaries that identify the results and outcomes of key R&D programs and investments, including any best practices and lessons learned. Congress could also leverage the Government Accountability Office (GAO) as a resource for understanding ROI and effectiveness of these programs.[33]

[31] https://www.opentech.fund/

[32] https://www.whitehouse.gov/presidential-actions/2025/04/advancing-artificial-intelligence-education-for-american-youth/

[33] https://cdn.sanity.io/files/d8lrla4f/staging/ba86536e3618d53a041611df0203fa4737965605.pdf

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.

The federal government must:

- Partner with state and local leaders to respond to education needs. The priorities that drive federal data and research work should be determined in partnership with state, territorial, tribal, and local governments, as well as educators and families. Research should have a visible path to being implemented, and research plans should not be designed without understanding on-the-ground needs and conditions.
- Build states' capacity to do R&D. The federal government must empower states to develop their capacity to conduct ed R&D. For states to execute R&D, they must have access to federal technical assistance and field-building resources. This could include more modern and searchable knowledge mobilization platforms, virtual collaboratives, and professional learning communities to facilitate dialogue and application of research findings. The federal government has historically played this role and must continue to as state education agencies assume greater autonomy in education.
- Help states iterate and improve. State governments can better serve local governments, communities, and families with expertise and insights from federal agencies. As opposed to the current compliance relationship, the federal role can

shift to assisting states as they pursue continuous improvement of their education systems and outcomes. The federal government can assist state leaders in scaling their bright spots and then elevate those successes as a model from which others can draw inspiration and insight.

Policy recommendations:

FOR CONGRESS

- Authorize a state ed R&D infrastructure competitive grant program. Congress could provide communities with flexible ed R&D dollars to develop individualized strategies for local education R&D. SEAs, LEAs, and consortia of both, alone or in partnership with other entities, like community-based organizations, could be eligible to apply for these funds.[34] Such a program would complement the R&D infrastructure that already exists, and enable states and districts to fill the gaps they identify in their surrounding R&D ecosystem, and allow funds to flow directly to those leaders.[35] States could leverage grant funding to pursue partnerships with a 'testbed' local education agency eager to innovate around defined areas, similar to the partnership between states and districts facilitated through efforts like LeanLab.[36] These structures could encourage cross-sector partnerships to ensure innovation and new models are not being operated in silos but co-developed by key partners while sending signals to private industry about emerging markets.

- Reinvigorate statewide systemic initiatives. NSF previously found success leveraging grants for Statewide System Initiatives, which incentivized partnerships between researchers and state-level partners to co-develop and implement meaningful R&D opportunities.[37] A reinvigorated set of statewide systemic initiatives could assist state leaders as they build ed R&D infrastructure, capacity, and expertise, and fund backbone organizations to organize the resources and support systems needed to implement evidence-based interventions or learning models in schools.

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[34] https://the-learning-agency.com/insights/how-the-next-esra-reauthorization-could-build-state-and-local-education-rd-capacity/

[35] https://www.alicoalition.org/wp-content/uploads/2025/03/ALI-Taskforce-Brief-Inclusive-RD-FINAL-1.pdf

[36] https://www.leanlabeducation.org/schools

[37] National Academies of Sciences Engineering and Medicine, pp. 96-97. (2024). Scaling and sustaining pre-K-12 STEM education innovations: Systemic challenges, systemic responses. National Academies Press. https://doi.org/10.17226/27950

- Authorize and invest in modern infrastructure for knowledge mobilization. Evidence synthesis–making the results of research more accessible and actionable–is a major opportunity for the federal government to provide value to the ed R&D ecosystem.[38] If R&D is to truly drive better outcomes in teaching and learning, Congress should improve knowledge mobilization–getting research findings into the hands of educational leaders and practitioners. Building on this report's recommendation to convene interagency leadership to recreate the success of the National Reading Panel (see "Invest in Research"), research agency leaders should regularly convene and publish research findings and leverage implementation science and the federal government's platform to keep state and local education leaders and the general public informed on its evolving insights. This could be done in connection with the legally required annual Condition of Education[39] report to share with the nation what has been learned from recent investments in ed R&D.

- Incentivize multi-state coalitions that pool research and procurement resources. Many individual states do not have the financial resources to conduct ed R&D on their own. The federal government could leverage financial incentive structures to encourage consortia to form among state and local education agencies to foster data and resource sharing. States that otherwise would lack capacity for these activities would be more likely to opt into this model. It could also increase the purchasing power of states by allowing them to co-fund acquisitions of products, R&D infrastructure, or teams of researchers.

FOR THE ADMINISTRATION

- Deploy state-level innovation labs. Current law requires Regional Educational Labs to partner with districts, states, and other education stakeholders to identify high-priority needs and ensure that applied research is conducted to address them.[40] The Regional Educational Laboratory Southeast did this effectively in partnership with Mississippi education leaders to produce significant gains in reading proficiency.[41] These labs should consistently – and not in pockets – leverage modern best practices to support state-led innovation and educational

[38] https://mitpress.mit.edu/9780262543224/teach-truth-to-power/
[39] https://nces.ed.gov/programs/coe/
[40] https://ies.ed.gov/ies/2025/01/education-sciences-reform-act-2002-0
[41] https://www.alicoalition.org/success-story/how-state-and-federal-rd-investments-helped-make-the-mississippi-miracle-possible/

achievement, such as being responsive to local needs, involving communities and practitioners, and pursuing an array of research methods to answer challenging research questions. IES could partner with state education leaders to design a set of priorities for regional education labs that could be used in an outcomes-based contracting process to ensure the labs are supporting strong alignment between state goals and federal ed R&D capacity.

- Incentivize Research-Practice-Partnerships (RPPs). RPPs have been proven to meaningfully shift practice for educators and local education leaders through mutually beneficial collaborations that promote the research on problems of practice, ideally improving the relevance of the research.[42] RPPs, such as the Houston Education Research Consortium (HERC)[43] and Wisconsin's Rural Education Research and Implementation Center,[44] are flexible and meant to be built based on the infrastructure of each partner. One such model for this could include federal funding to states to develop a research office that organizes these partnerships at the local level, with a reimagined IES serving as the network lead for these state research offices.

- Support R&D capacity-building positions or intermediaries. The federal government could fund non-profit intermediary organizations to run communities of practice for state education agencies to collaborate and share the results of their research and development efforts (this could include things like AI implementation, career pathways, summer learning, addressing chronic absenteeism, etc). Federal rules currently support roles at SEAs like NAEP and statistical coordinators, and could extend flexibility to also designate research-specific coordinators where one does not exist.

- Leverage tech-based solutions to synthesize and translate research to end-users. IES and other science agencies could build or invest in products that make research

[42] https://rpp.wtgrantfoundation.org/about/
[43] RESEARCH-PRACTICE PARTNERSHIPS IN EDUCATION: THE STATE OF THE FIELD
Caitlin C. Farrell, William R. Penuel, Cynthia E. Coburn, Julia Daniel, and Louisa Steup | 2021.
https://wtgrantfoundation.org/wp-content/uploads/2021/07/RPP_State-of-the-Field_2021.pdf.

[44] https://reric.wisc.edu/about/

more discoverable and actionable.[45] Current research databases are hard to search and use. There should be better tools for educators and administrators to quickly locate relevant research, utilizing a simple search interface that allows users to ask questions in plain English instead of using complicated search terms. IES should require research studies to include clear, searchable metadata so AI tools and users can easily find, organize, and highlight the findings, helping bridge the gap between research and real-world practice. Helping educators understand the cost of an intervention, the strength of the research base that underpins that intervention, and the expected outcome can also enable feedback loops. One model IES could draw inspiration from includes the Education Endowment Foundation, which uses direct engagement and behavioral science to encourage the uptake of education research in the classroom.[46]

[45] https://www.alicoalition.org/blog/using-ai-to-make-research-more-accessible-and-ultimately-improve-learning/

[46] https://educationendowmentfoundation.org.uk/about-us/how-we-work

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 the nation's 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.

Federal data sources also allow policymakers to benchmark and compare programs, institutions, academic performance, and other elements critical to informed decision-making. Federal statistics are also the backbone of information sources for parents to make decisions about their child's education, including the College Scorecard, which provides students, families, and counselors with vital information about college costs and outcomes.

Critically, whatever the next iteration of federal data collection, analysis, and dissemination looks like, the structure must include robust security, resiliency, and privacy safeguards to continue fostering trust in the system.

The federal government must:

- Measure what matters. The goals for education and workforce federal data collection should be to gather information to: (1) understand whether priorities (e.g., increasing academic achievement, career attainment) are being met through government-funded interventions; (2) create a foundation for research into what works well, for whom, and under what conditions to meet these priorities; (3) protect the civil rights of students and workers, and (4) foster shared accountability by evaluating the efficacy of government investments.

- Make data structured and systems interoperable. Public education and workforce data should be structured and open, making it easier to share. Structured data is organized systematically with a clearly defined format and well-defined relationships between different elements. Data systems with clear governance and interoperability enable different systems to read, share, and process data

consistently and securely. This mitigates some bias and accessibility concerns and allows AI systems to efficiently access, process, and "learn" from data, leading to better applications, predictive capabilities, and overall AI performance. When data is not in a structured format, it leads to a higher risk of unreliable information being fed into AI processes and misapplied.[47]

- Make data use possible. State governments collect most administrative data, including personally identifiable data, and serve as a critical bridge between local and federal systems. While most states now fund the ongoing performance of their data systems, they still require federal funding to seed modernization efforts and invest in human-centered design that can make their data more valuable and accessible (e.g., through dashboards, visualizations, and other tools).

  States also need clarity from the federal government on the application of federal laws and regulations to their work. Additionally, states benefit from economies of scale when the federal government provides technical assistance. States can provide local governments, communities, and state policymakers with better analysis for decision-making when they can rely on expertise and analytic capacity from federal agencies.

- Safeguard privacy and security. The protection of individuals' privacy and rights must be at the center of all data collections. Federal data collections should be as minimally invasive and burdensome as possible to accomplish publicly identified and agreed-upon (e.g., through statute) priorities and goals. Data should be used only for the purposes for which it was collected. For research, the default should be access to and use of aggregate or individual-level, but not personally identifiable, data. Restricted use access should be provided only when it is needed to accomplish research that advances agreed-upon goals. Where interaction data is used, relational privacy frameworks should also be applied. Data collected by a federal agency should protect individuals' privacy and be used to their benefit. Data should not be used for alternative purposes without public transparency and input.

[47] https://credentialengine.org/credentialtransparency-ai/

Policy recommendations:

FOR CONGRESS

- Consolidate federal statistical work in one central coordinating statistical agency. Education, early childhood, workforce, health, census data, among others, have historically been siloed, with various data collections being diffused across various agencies and with different privacy and security laws applying depending on the agency collecting the data. The federal government could consider empowering a single, consolidated statistical agency to coordinate the collection, analysis, and dissemination of federal statistical data. This agency should have an explicit, strong governance structure and transparent, legally authorized permissible uses of data, including privacy and security measures. Leading states such as Kentucky, California, North Dakota, Alabama, and Colorado offer examples of best practice models for a robust data governance structure. A centralized coordinating agency could also drive, in conjunction with the General Services Administration, clearer, more unified guidance, technical assistance, and support to state and local governments to implement and maintain data systems that enable appropriate access to and sharing, use, and protection of key education and workforce data.

- Invest in states to modernize cross-agency data systems, like Statewide Longitudinal Data Systems (SLDS)[48]. While states need to be able to sustain their data infrastructure to further their education and workforce goals, upgrading or modernizing technology and data systems on a large scale often requires an infusion of funding. Efforts like the Workforce Data Quality Initiative[49] have allowed states to make critical investments in their infrastructure, while states like New York have used their SLDS grants to connect workforce and education data. These efforts should be sustained and built upon. A new, dedicated block grant program (within the Census Bureau or elsewhere) like that recommended by the Advisory Committee on Data for Evidence Building, which would support state cross-agency data infrastructure, modernization, and governance, could provide the impetus for these modernization efforts.[50]

- Modernize the privacy regulatory infrastructure. Many of our federal privacy

[48] https://dataqualitycampaign.org/resource/what-are-sldss/
[49] https://www.dol.gov/agencies/eta/performance/wdqi
[50] Advisory Committee on Data for Evidence Building Year 2 Report, October 14, 2022, at pg 102-103, *available at*: https://www.bea.gov/sites/default/files/2022-10/acdeb-year-2-report.pdf

protections (e.g., Protection of Pupil Rights Amendment, Children's Online Privacy Protection Act, Individuals with Disabilities Education Act provisions, Higher Education Act restrictions) were enacted decades ago. For example, the bedrock of federal student privacy infrastructure—the Family Educational Rights and Privacy Act (FERPA)—was enacted more than 50 years ago and last underwent meaningful regulation in 2011. Additionally, there is no permanent, authorized federal body tasked with providing uniform guidance and technical assistance to states, territories, and local governments to implement these laws. As a result, the laws have not kept pace with changes in technology or policymakers' understanding of how technology and data can be used to support individuals, and state, territorial, and local governments have been left on their own to determine how this patchwork of outdated laws applies. Students' data privacy could be better protected by modernizing privacy laws, guidance, and the technical assistance structures provided to implement them by, for example, authorizing USED's Privacy Technical Assistance Center.

FOR THE ADMINISTRATION

- Sustain and modernize NAEP. NAEP, the Nation's Report Card, plays a vital role in helping not just state and federal government leaders but also employers and communities make decisions about the quality and comparability of state educational programs. States and communities use it to benchmark student achievement, employers use it to locate new bases of operation, and federal policymakers use it to assess investments. The scope, frequency, and staffing of NAEP must be sustained, as any reductions will hinder stakeholders' ability to extract timely insights about the condition of the nation's education system. IES should also pursue opportunities to modernize NAEP, such as leveraging AI for assessment item generation and testing.

- Establish a panel to evaluate the relevance of data collection. Foundational data collections and surveys should continue without interruption or restart immediately. That includes IPEDS, NSLDS, EdFacts, Common Core of Data, American Community Survey, National Teacher and Principal Survey, and the Civil Rights Data Collection, and foundational assessments such as NAEP and PISA. To ensure other tools, such as additional sample surveys, are valuable and efficient, the federal government should convene a panel of experts, including ample representation from K-12 and postsecondary educational leaders, to conduct a data review and recommend

streamlined data collections and infrastructure. The panel's recommendations could be provided to Congress to update the relevance of data collections and surveys and to minimize unnecessary burdens on stakeholders.

- Design for end users. Those responsible for contributing student data (e.g., administrators, educators, families) are often the last to see its benefits, and rarely is their user experience considered when public dollars fund data infrastructure. Systems should be designed with these and other appropriate state and local end users in mind. For instance, some data, like 50-state longitudinal survey data, is best gathered and disseminated from the federal government. But the end users of that data–state policymakers, education and workforce decisionmakers, and researchers–should be consulted about what is gathered and how it is made accessible. For example, public-facing products like dashboards allow policymakers and researchers to access public aggregate-level cross-agency data in one place.

- Provide states with data modernization technical assistance. Many states are resource-constrained and would benefit from federal support as they build their own secure, interoperable data systems and further their evidence-based policy goals. The federal government could serve as a force multiplier to state statistical agencies by providing funding as well as analytical capacity and training for state agencies and individuals.[51] This could be accomplished through something like an expanded Privacy Technical Assistance Center, or it could be achieved by certifying a set of "go-to" technical assistance providers from which states can seek assistance. Enhanced capacity support should also enable states to access data from other states or the federal government for a specific, identified purpose, through partnerships with trusted, public-interest entities that have secure and privacy-protected platforms to facilitate sharing on a case-by-case basis.

- Support a modern federal data infrastructure. To accelerate evidence-based policymaking and foster innovation, we recommend modernizing the federal data infrastructure such that data is open, structured, and interoperable. For example, structured and open data could unlock historical data from NAEP, allowing researchers, policymakers, and developers to use decades of robust assessment data to rigorously test, validate, and refine the effectiveness of new instructional

[51] https://dataqualitycampaign.org/wp-content/uploads/2024/11/DQC-Transition-Memo.pdf

tools and educational interventions.

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.[52] 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 (via the Intergovernmental Personnel Act, cooperative agreements, etc.).

- Data Governance - The federal government must have transparent policies, processes, and people in place that build the public's trust in the collection and use of data while maintaining security and privacy.

- Procurement - The federal government's purchasing power is one of its greatest assets. When engaging in ed R&D, federal teams need the ability to pursue flexible procurement strategies (e.g., prize challenges, advance market commitments) to meet different R&D goals. This 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, leading to powerful solutions that often don't happen in silos. Agencies need 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.

[52] https://learningsystems.org/about/#headingLearning

- 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.

What's Next

The Alliance for Learning Innovation will be making regular changes and updates to this report based on feedback while also working on a series of blog posts to turn elements of the blueprint into more detailed policy recommendations. Follow along on LinkedIn (www.linkedin.com/company/alliance-for-learning-innovation/) and ALI's website (https://www.alicoalition.org/future). If you are interested in providing feedback or authoring a more detailed recommendation, please contact future@alicoalition.org.