The Role of Policy in Advancing the Science and Practice of Learning and Development

A recent, comprehensive research review affirms that the science of learning and development presents critical lessons—points of agreement across multiple scientific disciplines—that should play a key role in designing education and related systems to help each and every child achieve his/her full potential. The science supports an optimistic view of human potential. Each child is born with billions of possible neurological pathways to success. Each child progresses in his/her own unique, non-linear way, and our brains remain malleable well into adulthood, particularly in early years and adolescence. Each child's success depends heavily on relationships, experiences, and environments. This includes exposure to adversity, and purposeful efforts to mitigate its effects. The science is clear that if we want each child to achieve his/her full potential, and if equity and opportunity are urgent concerns, then we must redesign education systems to focus more on meeting the unique needs, interests, and abilities of each and every child to achieve high expectations.

Some schools already apply principles of practice aligned with this important scientific convergence. These principles include: a focus on promoting school environments with strong adult relationships and positive conditions for learning; teaching that combines explicit instruction with opportunities for application and inquiry and that continuously builds from students' prior knowledge and experiences but challenges them to understand new content and concepts; purposeful development and integration of students' academic, social, and emotional skills; and structures that reach beyond the classroom to provide tiered systems of support and extended learning opportunities.

This knowledge from science and the evidence-based practice principles also present important lessons for policymakers to promote best practices from particular examples to the broad scale children need in their communities, states, and nation.

At the broadest level, policy – federal, state, and local – establishes the rules and conditions within which education is delivered and change can occur and scale. Policy can create structures and procedures; it can create and enforce norms of behavior. Policy adds specifics to a general vision, and can turn exhortation into incentive or even command. Making policy means setting priorities, allocating resources, and making choices that affect lives—often a great many of them. Policy can support or suppress innovation, and it can advance or tarnish our public values. Policy can ignore or exacerbate inequity, but policy can also do something about it.

Our nation's education system is a deeply human system – from the classroom to state and local school boards to Congress. Policy can be a powerful lever for change. However, if policy ignores the capacity and ability of practitioners and organizations—at any level of the system—to implement the policy, or gets too far ahead of that implementation, then buy-in, growth, and sustainability will suffer. The why and how of policy change should be understood by implementers to support adoption and scale. Moreover, teaching and leading are essential to student success—in terms of instruction, supports and relationships. Advancing the science of learning and relevant practices will require design and structure shifts combined with increasing teacher and leader capacity, learning and resources. Given what we know about learning and development from the science, policy should seek to drive towards consistency in the quality and outcomes of the system for students, not towards conformity in how that education is delivered.

In many cases, meaningful change will require a comprehensive, sequenced, aligned approach for systems change in which efforts to advance practice, tools, training, communications, and research should come before broad changes in policy. This means that policy change should include support for innovation and collaboration through networks and investment in the tools and talent necessary for innovation and improvement. The science also

points, however, to broader, bolder changes that may require new institutions and investments. High-quality early learning opportunities is an example. New systems of educator preparation and support is another.

The science of learning and development is constantly expanding and evolving, as is our knowledge of effective practice. To best use new knowledge, educators, districts and even states must understand themselves to be part of a learning system that values research, evidence, innovation, evaluation, and continuous improvement. This shift calls for policy efforts to increase support for research and development and to build mechanisms for continuous improvement at all levels of the system.

Furthermore, the science of learning and development implicates more than just the education ecosystem. It involves other critical needs and systems related to strong families, including student physical and mental health, nutrition, safety, and more. At a minimum, this means better integrating these other systems to meet each student's needs, and calling for changes such as early, comprehensive whole-child screening; improved data systems, privacy, and use; and aligned services.

Our education ecosystem is greatly complex, with multiple levels (e.g., early learning, K12, and higher education), points of authority (e.g., state, local, school, federal, family, community), and political contexts. This structure can make it difficult to break down barriers and create conditions that best serve all students. Too often, our nation's education policies, structures, and politics inhibit such decisions, are inequitable, and lack a nimbleness to respond to changing student and community needs. Changing education practice at scale requires policy change, but that in turn requires appropriate advocacy and political work. These are beyond the scope of this brief paper but will be important for this work to succeed. Before that, however, we should develop a shared vision and policy agenda for better integration of science into the education ecosystem.

The policy ideas surfaced in this document that can help to advance the alignment of practice with science are grounded in several core principles:

- They are directly implicated by the **science of learning and development**. There are other meaningful drivers of change for our education system, but we are focused specifically on what comes from the science.
- They are directly in **support of the practice shifts** called for by the science of learning and development and by evidence of effectiveness.
- They are purposely designed to **advance equity** to best meet the needs of disadvantaged students and overcome challenges such as those based on poverty and racial injustice.
- They are meant to reflect **high expectations and rigor** – for all students, for all adults, and for the system as a whole.

In considering scores of policy ideas both new and familiar, we present here ten initial policy areas to inform further discussion and possible action. These are not silos. They overlap and work conjointly to create a system deeply informed by the science of learning and development.

Ensuring our education system is centered on the science of learning will require altering the following aspects of the education system and its structures each discussed in more detail in the appendix that follows:

- **School and District Design** – altering use of time to better meet the needs of students and teachers; addressing school and staffing structures and capacity; improving access and delivery of student support services; and supporting effective instructional designs.

- **Curricula, Instruction, Assessment and Student Advancement** – addressing how, what and where students learn, engage in and guide their own learning, are assessed, and advance through school.

- **School Climate, Social Emotional Learning and Comprehensive Supports** – creating a physically and emotionally safe learning environment; fostering a sense of belonging; and addressing the effect of adversity, stress and trauma.

- **Human Capital Systems** – addressing practitioner development opportunities, including pre-service training, credentialing, career pathways and professional learning.

- **Resource Equity** – ensuring education and other resources are distributed in ways that best respond to student needs.

- **Data Systems and Use** – making data timely, accessible and actionable for practitioners; supporting the data literacy of educators and parents; supporting schools and educators with appropriate, data-driven and evidence-based interventions; and ensuring privacy and security.

- **Student Transitions** – reducing and facilitating transitions to best support and sustain student learning and development from early learning to post-secondary education.

- **Early Childhood Education** – increasing the access, quality, and affordability of early learning; improving alignment to elementary education; and improving delivery of comprehensive services.

- **Family Engagement** – engaging families in students' learning and coordinating comprehensive services for the family.

- **Research, Evidence and Continuous Improvement** – supporting the development of a learning system, including the culture and structures necessary for continuous improvement and the infrastructure that utilizes and supports research to inform practice and policy.

APPENDIX

Examples of Policy Opportunities

School and District Design

District and school design elements – such as how instruction takes place, how time is used in school, and staffing structures – can either facilitate or inhibit what we know from the science on supporting relationships, working with students' non-linear and individual development, and maximizing learning. Moving towards more schools that are informed by the science of learning and development to help all students achieve their full potential (including college, career and civic readiness) would require supporting access and delivery of student support services across a district, altering school use of time and staffing structures to allow for teacher collaboration and more small group and one-on-one time with students, addressing school and staffing structures and capacity, and effective instructional designs (including appropriate use of technology).

Example Policy Actions

- Utilize innovation, school improvement, charter, or waiver authorities to allow districts and schools to use time differently, drive different curricular and student advancement opportunities and align budgeting in support of student-centered school design and decision-making.
- Allow or incentivize schools to adjust schedules to provide for new staffing structures and support for ongoing educator collaboration and aligned professional development; to support personalized learning including small group and individual instruction, competency-based education, and potential shifts to student advancement, as well as faculty-student advisories and student-to-student interaction; and to ensure time for parent and family engagement.
- Provide for comprehensive service delivery and more data sharing to ensure schools and districts have the facilities, time, capacity, and tools to deliver or provide access to services.
- Establish school, grade-span and feeder pattern structures that integrate early learning opportunities and limit and improve transitions, such as K-8 configurations and improved information sharing between schools.
- Provide more extended learning time, summer learning, and out of school learning opportunities.

Curricula, Instruction, Assessment and Student Advancement

Science, and supporting practice, is clear that student learning is unique, non-linear and dynamic. Students learn best when their experience and knowledge are utilized and they are engaged, challenged, motivated, and feel a sense of purpose. How and where students learn, how they can engage in and guide their own learning, how they are assessed, and how they advance can support or impede student growth. States and districts can respond to this knowledge by supporting shifts to whole child personalized learning, including rigorous competency-based learning and opportunities and supports to catch up; a broader and deeper assessment system; new means to accumulate credit, demonstrate knowledge and advance; and opportunities for meaningful student agency.

Example Policy Actions

- Adopt vision/goals/standards that reflect importance and interdependence of the full array of knowledge and skills needed for college, career, and civic success.
- Develop a clear vision and definition of what whole child personalized learning means for the state or district.
- Develop content rich and rigorous curricula that supports college and career readiness and embeds social and emotional development.

- Develop an aligned assessment system that includes a full array of assessments, including performance- and project-based assessments, and audit assessment systems for redundancy and lack of alignment to eliminate assessments as appropriate.
- Create authorities, capacities, and opportunities to pilot personalized learning, including development of competency-based curricula and related learning progressions; course sequencing; student advancement and credit accumulation opportunities; graduation requirements; and related assessments.

School Climate, Social Emotional Learning and Comprehensive Supports

The science of learning and development is clear that students are more likely to learn when they feel physically and emotionally safe in schools, when they have a sense of belonging, and have strong adult and peer relationships. While students are remarkably resilient in responding to adversity, trauma, and stress, education systems can do more to create means and supports for affected students to recover and all students to thrive. Access to needed services, positive school climates, developing social emotional skills and academic mindsets, and advancing practices that promote inclusion will support learning and healthy development.

Example Policy Actions

- Ban exclusionary and punitive discipline practices in favor of more effective and developmentally-appropriate practices (such as restorative practices) and provide relevant training for practitioners.
- Develop cross-agency means to deliver comprehensive services, support sustained funding, and create mutual accountability for service delivery, including at school sites.
- Develop and provide funding for multi-tiered systems of support to meet students' academic and non-academic needs, improve school climates, and promote inclusion, and provide necessary training and resources for practitioners to utilize such a system.
- Engage with and provide training for school leaders and teachers on comprehensive service needs and delivery options.
- Integrate social emotional skill building into curricula and school design and provide necessary professional learning.

Human Capital Systems

The science of learning and development highlights that relationships and student engagement are critical to learning and development, which has important implications for the central role of prepared, supported and continuously-learning educators and other adults in the education system. Educators, principals, counselors and other school staff need the knowledge, capacity, skills, and tools (such as time and data) to support students' academic, social and emotional development, understand the impact and importance of relationships, teach in a personalized and differentiated way, and create a safe and productive learning environment. This will require shifts in policy across the continuum of educator preparation, placement, support and ongoing development.

Example Policy Actions

- Update early childhood and K-12 pre-service requirements, redesign professional learning, and offer micro-credentials for teachers and leaders to reflect the science of learning, provide personalized learning, address unconscious bias ,use universal design for learning, and develop data, research and assessment literacy.
- Amend licensure/certification and renewal requirements to reflect updated pre-service needs informed by the science of learning.

- Support new staffing structures and roles to better reflect whole child personalized learning, relationship building, and more collaboration among teachers, which may require developing new career pathways or providing additional staffing in schools.
- Support flexibility to provide educators time in school for personalization, collaboration, professional learning, and meeting students' academic and other developmental needs.
- Create recruitment efforts to increase the diversity of teachers and leaders.
- Update teacher-of-record requirements to support personalized learning and alternative credit accumulation options, including the advancement of work-based, experiential- and project-based learning.
- Create professional learning communities and other structures that will help education become a learning system.

Resource Equity

One of the most exciting and promising insights from the science of learning and development is the clear and ongoing potential for every child to achieve high levels of learning and development. However, the science also illuminates multiple ways in which challenges such as trauma can impact students' learning and development and require additional supports and buffers to get or keep students on track to success. For that reason, the science of learning and development has significant implications for the need to ensure that education and related resources are distributed to ensure that children facing adversity receive what they need.

Unfortunately, existing education policies ensure that resources – funding, course work, human capital, tools – are dispersed in our nation's schools in deeply inequitable ways. Instead of resources ameliorating challenges for students, the current inequities and related policies can exacerbate them. States and districts send less funding to low-income communities. Low-income students are taught by less experienced and out-of-field teachers at higher rates than their wealthier peers. Low-income and students of color have less access to college-preparatory coursework and tools such as technology. While shifting resources is politically challenging, those shifts are critical to addressing the diverse and full range of student needs. Additionally, the rigidity of how resources are currently dispersed (with restrictions layered in at every level) can work against nimble, student-centered decision-making.

Example Policy Actions
- Identify, evaluate, make transparent, and address the full range of education resources – including funding, coursework, human capital, access to early learning, out of school learning, and tools – and how they are distributed to meet student needs.
- Develop cross-agency means to deliver comprehensive services, support sustained funding, and create mutual accountability for service delivery.
- Create flexibility in funding use to better align funding to student needs.
- Develop and implement weighted student funding formulas that provide more resources for students with additional needs.
- Redesign procurement policies to ensure they are not exacerbating inequities and impeding flexibility.
- Focus resources to design and sustain school improvement efforts in low-performing schools to align with insights from the science of learning and development.

Data Systems and Use

The science of learning and development shows that successful learning is deeply personal since each child is unique. Relevant and actionable data are critical for educators and system leaders to identify and respond to student needs and monitor progress. Such changes will likely require inter-operable data systems, such as those

including information on student achievement, development, and health, to inform screening and supports and to facilitate accountability, evaluation, research, and improvement.

Data must be available on a timely basis, actionable for practitioners and policymakers, and collected in ways that ensure student privacy and data security. Relatedly, educators need to be provided with professional development and support to be data literate in order to provide whole child personalized learning. Given the role of parents and communities in supporting and sustaining change and the importance of student agency, students, parents, and community stakeholders must be part of data connectivity and literacy efforts as well.

Example Policy Actions
- Evaluate and update data systems to ensure data are accurate, actionable, timely, private and secure, including providing for early warning data, real-time data on student progress, and school climate.
- Require data literacy training in educator pre-service programs and provide professional development in data literacy.
- Develop data systems that integrate data across multiple agencies and grade spans to provide a fuller picture of children's needs and services and facilitate transitions.
- Provide information, time, coaching, and other support for data use and aligned intervention for both individual student needs and school-wide needs.

Student Transitions

Students make transitions throughout their education – from early childhood education to elementary schools, across feeder patters through middle and high school, and then to post-secondary opportunities. While those transitions are inevitable, they can impact students' sense of belonging in schools, their adult and peer relationships, curricular continuity, and access to academic and non-academic supports in their receiving schools. Schools and systems can take steps both to reduce unnecessary transitions and to maximize student learning and development across transitions.

Proposed Policy Actions
- Require or support needs assessments, student transition plans for both academic and non-academic needs, and supports at each point in the education continuum, including early identification and intervention services provided prior to school enrollment.
- Improve data sharing and collaboration between schools, including across feeder patterns, to support student transitions across grade spans and ensure students experience no gaps in academic and non-academic supports.
- Reduce the number of transitions by altering school structures, such as through school-site early childhood programs and K-8 models for elementary and middle grades.
- Develop and use early warning indicator systems and "on track" efforts that use data and intervention to identify and address struggling students.

Early Childhood Education

From birth, children's environments and relationships, as well as exposure to adversity, affect their learning and development. From individuals' early years through adolescence, the brain has the ability to grow and respond to experiences and relationships. In the early years, brain development is rapid and establishes the foundation for building complex skills and abilities that will support learning and development throughout the education experience. High-quality early education settings from birth can buffer stress and trauma and promote resilience as well as support strong learning and development.

Because children and families experience profound inequity related to early childhood options, states and communities should increase access, quality, affordability and alignment to elementary schools, as well as improving access to and delivery of comprehensive services in the early years.

Proposed Policy Actions
- Improve quality of, information on, and access to early learning options from birth, including through targeted resources to support low-income children and families.
- Ensure all families have access to comprehensive services and supports to meet their needs, including health needs and appropriate screenings, , home visiting, full-day and -year child care (including center based and family care), full day pre-K, and kindergarten.
- Improve alignment across early learning settings and K-12, including comprehensive standards that include the full range of development (birth-12th grade), collaboration on family engagement, shared professional learning, and needs assessments.
- Support collaboration between teachers, school and district leaders, and early childhood educators to support student transitions.

Family Engagement
The science confirms that the effects of trauma and adversity on adults can impact children and their development. Addressing and/or ameliorating the causes of trauma and adversity can lead to building and supporting adaptability. Relatedly, the strengths and resilience of their families and communities are important to children's success. As such, engaging families and providing or coordinating comprehensive services will support children's learning and development as a force multiplier.

Example Policy Actions:
- Innovate on co-location services at school sites that support parents and children, such as economic development services, WIC services, or job training programs.
- Provide capacity to build family and school relationships through communication and student supports, and ensure long-term and continuous engagement structures.
- Ensure materials and supports are provided in languages that meet the full needs of the community.

Research, Evidence and Continuous Improvement
Knowledge from the science of learning and development continues to grow and evolve. Creating sustainability in improvement and scale in advancing change based on the science of learning and development calls for supporting a culture of and structures for innovation and continuous improvement at all levels of the continuum; as well as an infrastructure that supports and utilizes research to inform practice and policy to make the education system a learning system.

Example Policy Actions:
- Provide significant additional investments in research and development infrastructure (e.g., Regional Education Laboratories, research-practice partnerships, National Institutes of Health, and Institute of Education Sciences) commensurate with national spending on education and the role of education in the nation's progress, and create additional connectivity between education practice and those research entities.
- Create research-practice partnerships at the district and state levels to evaluate the efficacy of education practice and policy, respond to and act on student data, and to inform a shared research agenda

- Develop data-informed structures and processes that embed regular reflection on whether systems, supports and interventions are meeting student needs.
- Support and collaborate with schools on developing and utilizing needs assessments, diagnostic reviews, and the school improvement process to iterate and take action on research, evidence, and continuous improvement.