Carnegie Foundation
for the Advancement of Teaching

2025

A NATIONAL CALL TO ACTION

A RESEARCH AND DEVELOPMENT AGENDA

FOR HIGH SCHOOL TRANSFORMATION

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“To rise at this time, universal high school transformation is the key to our nation prevailing, and a robust Research and Development Agenda is essential to help get us there.”

TIMOTHY KNOWLES, PRESIDENT
CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF TEACHING

FOREWORD

American high school education is at a crossroads. While the world accelerates toward an AI-driven economy that demands creativity, critical thinking and adaptability, our high schools remain trapped in an outdated architecture designed for a different era. The evidence is stark: Employers seek skills they don't see reflected in diplomas and degrees;[1] four-year college enrollment is dropping;[2] and economic security is elusive for the vast majority of Americans. Since the global pandemic, chronic absenteeism has soared; student disengagement has accelerated; and educator burnout has reached crisis levels.[3]

This is not a moment for incremental change – it is a moment for transformation.

Transformation will not result from innovations and interventions at the edges of our education system, but instead, it will require direct and bold interrogation of the structures and standards that lock our system in the past and prevent our schools from preparing young people for today's world. Thus, the time has come to move beyond the "Carnegie Unit" or "credit hour" and its century-old grip on American education.[4] The Carnegie Foundation for the Advancement of Teaching (Carnegie) is committed to replacing seat time with demonstrated learning, isolated classrooms with interconnected ones, and narrow academic measures with comprehensive preparation for life and work. The question is not whether change is needed, but whether we will act with the urgency that the moment demands.

The window is open. Across the nation, thousands of communities have created "portraits of a graduate" focused on the knowledge and skills necessary for success in school, work and life. States have started to make important policy shifts: reimagining the high school diploma, creating new opportunities for students to earn meaningful credentials before they graduate, and ensuring competency (not time) is the primary currency of learning. Critically, there are hundreds of extraordinary schools – in rural, urban and suburban communities across the nation – that illuminate what the future of high school can be.

FOREWORD

Certainly, this window of opportunity is shaped and influenced by countless determined educators and visionary leaders who have come before us. However, we must be clear-eyed about the long history of promising innovations that have struggled to endure within a system designed for a different time.[5] While examples of elegant efforts to reimagine high school span the century, the reality is that our best efforts have not taken root, sustained, or scaled.

This time, our approach must be different. The stakes are as high as they have ever been – for young people, the economy, democracy and our social fabric.

A VISION FOR TRANSFORMATION

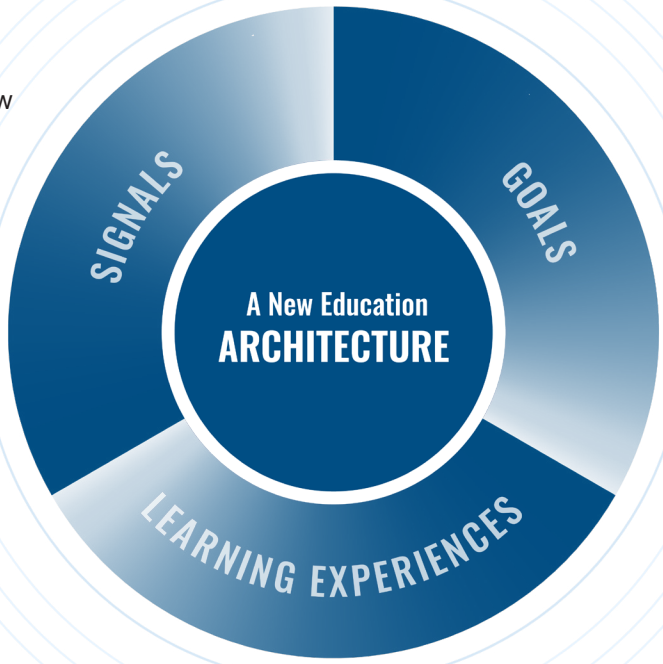
In collaboration with XQ Institute[6] and partners from across the nation, we are committed to building a new architecture for the American high school.

We believe the foundation for the American high school will be grounded by:

Ambitious goals for what students should know and be able to do, inclusive of both disciplinary knowledge and the essential skills young people need to thrive.

New learning experiences across subject matter, rooted in the science of learning, that ensure teaching and learning is reliably engaging, rigorous and experiential.

Signaling systems that provide clear insights to students, families and educators to help them accelerate learning and development.



Imagine high schools where:

- The high school diploma is grounded in achieving academic excellence **and** expands to include a broader set of skills required for success in work and life
- Students are engaged in real-world problem-solving every day
- Rich learning experiences take place in the classroom and community, and students are given credit for what they know and what they know how to do, wherever they learn
- Educators are empowered with the tools and supports they need to develop both academic and life-ready skills
- Families are partners in decision making, with access to meaningful, actionable data about student progress – data that provides a clear view of the pathway students can follow to postsecondary education or work

A VISION FOR TRANSFORMATION

- Sector boundaries between secondary, postsecondary and workforce are highly permeable and enable seamless transitions and multiple pathways to success
- Assessments capture the full range of student development in and out of school, provide timely insights to families and educators, and can easily be made legible to postsecondary institutions and employers
- Community organizations, cultural institutions, employers and postsecondary institutions are co-creators of student learning experiences and contribute directly to high school student success
- Students flourish and love school

This vision is not utopian – it is achievable. It will require coordinated action across the entire education system – actions that are guided by research that illuminates what works, for whom, and under what conditions. Coupled with these insights, we will be able to rapidly develop models of schooling and tools that accelerate impact and transformation at scale. That is the purpose of this Research and Development Agenda (R&D Agenda).

> "Americans have faced a similar seismic moment before. At the turn of the last century, the nation transitioned from an agrarian economy to an industrial one, and in less than a lifetime, a quarter of the labor force left farming. As communities realized high school would be the engine for ensuring their children's prosperity, a uniquely American idea was born – universal high school education – which powered the U.S. economy and democracy for a century.
>
> We are at a similar juncture today. To rise this time, universal high school transformation is key to our nation prevailing, and a robust Research and Development Agenda will be essential to help us get there."
>
> — TIMOTHY KNOWLES, PRESIDENT
> CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF TEACHING

A RESEARCH & DEVELOPMENT AGENDA

The priorities outlined below are **not** a reform agenda, focused on another list of things educators must do. This is an R&D Agenda, designed to focus resources and effort on building the knowledge and tools to inform and drive high school transformation in the decade ahead. To these ends, we will undertake three kinds of research:[7]

Discovery Research

Explores current practices, identifies promising innovations, and maps the landscape of what exists across different contexts and communities.

Development Research

Focuses on creating, testing and refining tools, practices and systems through iterative cycles of design and implementation in real-world settings.

Impact Research

Evaluates whether policies, programs and practices achieve intended outcomes, for whom and under what conditions.

All of the **work described herein will be conducted in close collaboration with scholars, practitioners and policymakers nationwide**, ensuring that questions emerge from authentic needs, tools are developed in response to those needs, and that findings translate into actionable insights for those with direct, daily responsibility for high school teaching and learning.

FOUNDATIONAL R&D PRIORITIES

FOR HIGH SCHOOL TRANSFORMATION

TWO ESSENTIAL FOUNDATIONS

To make sustainable change at scale, we must build knowledge about two foundational and crosscutting domains, and eight interconnected R&D priorities.

FOUNDATION I: ALIGNED PUBLIC POLICY

Build empirical evidence about the legislative, regulatory and governance frameworks that support high school transformation.

Innovation is regularly hampered by the constraints of outdated policy structures designed for an industrial-era education system. Policy alignment requires coordinated and coherent action across multiple levels of government to establish standards, remove barriers and create incentives for innovation.

Examples of promising public policy include:

- **Competency-based progression policies** that replace seat time requirements with demonstrated mastery
- **Flexible credentialing frameworks** that recognize learning across multiple contexts and providers
- **Cross-sector incentives** that foster collaboration, establish strong, scaled student pathways and eliminate boundaries between secondary, postsecondary and workforce
- **Assessment and accountability reforms** that measure what matters for student success beyond narrow academic metrics
- **Educator preparation and certification standards and practices** that reflect the evolving role of teaching in an AI-shaped world
- **Resource allocation models** that direct funding toward outcomes, not inputs

Without such policy shifts, even the most innovative schools and systems will struggle to sustain and scale effective practice. Conversely, enabling policies can accelerate adoption of promising innovations across systems, states and regions. This R&D Agenda seeks to ensure public policy makers have coherent, evidence-based guidance to drive decision making and resource allocation that will transform high school learning and impact.

FOUNDATION II: AI AND INFRASTRUCTURE

Build empirical evidence about the digital, physical and social infrastructures required to deliver sustained impact.

The rapid emergence of artificial intelligence is fundamentally reshaping the entire educational landscape. Generative AI creates new possibilities for personalized learning and assessment; shifts how, where and when learning can happen; disrupts curriculum design, development and distribution; promises new and powerful approaches to data analysis and the provision of actionable insights to students and teachers; and spurs opportunities for groundbreaking models of competency-based teaching and learning. For those reasons, in the decade ahead we must devote unparalleled attention and substantial investment to understanding the promise and impact of artificial intelligence on the American high school. We must determine when, why and for whom it adds value – and when, why and for whom it does not.
In particular, we must build evidence about the value of:

- **Digital platforms and tools** that enable personalized learning, competency-based measurement and support transitions across sectors (e.g., from high school to college or work)
- **Adaptive learning systems** that customize instruction in real time and provide educators and families with actionable insights about student progress
- **Data and signaling systems** that securely capture fulsome student development and facilitate trusted communication between schools, families, postsecondary institutions and employers
- **AI systems** that augment human teaching capacity, automate routine tasks, and thereby create opportunities to reimagine the role of teacher

TWO ESSENTIAL FOUNDATIONS

We must also build knowledge about the requisite physical, social and institutional infrastructures that contribute to improved outcomes and new modalities of high school education.[8] For example:

- **Physical learning environments** that support flexible, project-based and community-connected learning
- **Learning networks** that connect educators across contexts to share practices, solve common problems and accelerate improvement across geographies
- **Learning ecosystems,** powered by community partnerships, that provide students with authentic learning opportunities, robust pathways to college and career, and opportunities for students to learn in multiple contexts as part of their core high school experience

Finally, as artificial intelligence reshapes how we deliver, assess and improve education, we must build knowledge about the interaction of digital, physical and social infrastructures and how together they can create new conditions for innovative practices to flourish and spread.

> "Redesigning high school for today's learners and economy necessitates a fundamental rethinking and blurring of the lines between outdated education systems and their connection to the world of work."
>
> — JOEL VARGAS, JOBS FOR THE FUTURE

R&D PRIORITIES FOR ACTION

Through extensive collaboration with students, families, educators, employers and community based leaders nationally,[9] Carnegie has identified eight interconnected R&D priorities that will help catalyze and sustain high school transformation from time-based to competency-based models that better prepare students for postsecondary education, the modern economy and civic life.[10]

R&D PRIORITIES FOR ACTION

1. SHARED VISION AND DECISION-MAKING

Create shared understanding and decision-making across communities for transforming high school.

Transformation begins with collective commitment. Communities must engage all stakeholders – students, families, educators, employers, policymakers, postsecondary institutions and community organizations – in creating a shared vision for what high school should be, within and beyond the classroom. This requires moving beyond traditional top-down approaches and embracing collaborative co-design efforts.

> **Key Research and Development Questions**: How do we support collective action and communicate success across diverse communities to support high school transformation? What decision-making structures and methods sustain transformational practices and focus on student learning? What are the most effective ways of communicating with families and other stakeholders about the competencies and durable skills all students need to be successful in the future?

2. CULTURE OF TRUST

Establish a supportive learning culture and positive relationships for student and educator connection, purpose and agency.

Transformation cannot occur without supportive relationships and a culture where all members of the school community are valued, connected and empowered. This includes building belonging, purpose and agency for both students and educators.

> **Key Research and Development Questions**: What strategies strengthen relationships, belonging and impact? How do we build trust and agency for impact at scale? What conditions support both student and educator well-being?

> "The grade doesn't matter if you're not going to learn anything from the grade, and you can't really learn anything from it if you're not told why you got it wrong in the first place."
>
> — 12TH GRADE STUDENT[11]

3. CONDITIONS FOR EDUCATOR EXCELLENCE

Reimagine the role and working conditions of teachers and leaders to empower educators to accelerate the development of academic and durable skills.

Educators are the cornerstone of transformation. As artificial intelligence reshapes education, teachers will assume entirely new roles and will need new kinds of training and support to thrive. This involves professional learning to transition to competency-based teaching and learning, support using AI tools effectively, becoming expert in curating and personalizing learning experiences, and building strong partnerships with families. In tandem, teacher and leadership preparation programs, school and system leaders, and policymakers must identify effective methods and incentives to support improved teacher preparation, recruitment, retention and well-being.

> **Key Research and Development Questions:** How should we architect the role of teacher and leader for high schools of the future? What are the implications for teacher preparation and certification? What professional learning models build educator capacity to develop academic and durable skills and transition to competency-based learning and teaching?

4. REAL-WORLD LEARNING EXPERIENCES

Reimagine the high school canon, ensuring student learning experiences are grounded in science and are reliably engaging, rigorous and experiential, moving beyond seat time.

Students want learning that connects to their lives and futures. Whether through project-based learning, community partnerships, or work-based learning experiences, students need opportunities to apply their knowledge to real challenges while developing critical thinking, creativity and other durable skills that predict success in young adulthood.[12]

> **Key Research and Development Questions:** What kinds of learning experiences effectively integrate academic and durable skills? What are the most promising examples of real-world high school learning, across disciplines? What is the impact of engaging, rigorous, experiential learning experiences on the long-term success and well-being of high school students?

5. INTEGRATED PATHWAYS

Create learning ecosystems, tools and structures spanning high school, postsecondary and career, to significantly advance student opportunity beyond graduation.

The artificial boundaries between high school, postsecondary education and career must give way to robust, seamless pathways to purposeful lives and careers. This includes developing institutional structures that span high school and postsecondary education, and expanding and strengthening school-to-career pathways, such as apprenticeship and internship programs. Further, we must identify and scale tools and interventions that provide high school students with **much more robust** college and career guidance throughout their high school years.

> **Key Research and Development Questions:** What are effective models for integrated pathways across high school, postsecondary and the workforce? What are the most promising models for breaking the four-year high school model, and enabling students to progress to postsecondary school or career preparation when they demonstrate competency? Which pathway approaches expand access, avoid tracking and improve educational attainment and earnings over time?

> "Transforming education requires breaking down long-standing silos between federal and state agencies, secondary and postsecondary education, and labor and workforce development to create a seamless system that supports students from high school through college or into meaningful careers. When we align education with workforce needs, we not only expand opportunity for students but also strengthen the future of our communities and economy."
>
> — CHARLA LONG, COMPETENCY-BASED EDUCATION NETWORK

6. ACCESS TO MEANINGFUL CREDENTIALS

Increase access to credible, accelerative credentials through high school.

All students should have multiple pathways to earn postsecondary credit and viable industry credentials while in high school (e.g., dual enrollment, early college, advanced placement, career and technical education certification, apprenticeships). This requires robust partnerships between systems, postsecondary institutions, employers and policymakers – to remove barriers, provide adequate incentives and ensure broadscale access.

> **Key Research and Development Questions:** How do we ensure all high school students have the opportunity to earn postsecondary credit and credentials? What are the patterns of access and outcomes for accelerative credentials? What are the characteristics of successful partnerships that reduce barriers and improve high school and postsecondary outcomes?

7. ACTIONABLE FORMS OF ASSESSMENT

Build valid and reliable assessments of academic and skill development, capture evidence of learning from a wide variety of contexts, in and out of school, and provide useful insights to students, educators and families.

Moving beyond seat time requires assessment systems that capture learning across multiple contexts – from traditional classrooms to internships, community experiences and digital environments.[13] These systems must incorporate diverse methods of assessment, including performance-based tasks, student portfolios and authentic demonstrations of mastery. Such assessments must meet rigorous standards for validity and reliability while serving dual purposes – informing instruction to improve learning and generating trusted credentials for transcripts and diplomas.

> **Key Research and Development Questions:** What assessment approaches effectively measure durable skills and maintain academic rigor? Which AI-powered assessment tools are most effective in assessing authentic student work? What kinds of insight systems accelerate student learning and improve teacher practice?

8. RELEVANT INSIGHTS FOR FAMILIES

Create tools and methods for educators to engage with families to advance student learning and success, in and beyond high school.

Families are essential partners in student success, and they need clear, actionable information about their child's progress and pathways. This requires new approaches to family communication that go beyond traditional grades and report cards, to help parents and guardians understand and support their child's development and see clearly the pathways students can take to postsecondary education and work.

> **Key Research and Development Questions:** What tools and guidance help educators communicate effectively with families about student progress and viable student pathways to college and work? What is the impact of strengthened school/family partnerships on student learning and educational attainment? How can families have active voice and be authentic partners in high school transformation?

MOBILIZING COLLECTIVE ACTION: A MULTISECTOR IMPERATIVE

The transformation of American high schools cannot be achieved by any single organization or sector.

A generational transformation requires unprecedented collaboration among:

Educators, Families, and Students who will activate these priorities in their local contexts – sharing stories, building coalitions and testing new approaches while learning together.

Policymakers who create enabling conditions through legislative and regulatory frameworks that support and incentivize high school transformation, competency-based progressions, cross-sector collaboration, and innovative assessment and credentialing systems.

Philanthropic Funders and Intermediary Organizations that make strategic investments in innovations, and support the development of tools and infrastructure to meet emerging demand.

Scholars working in partnership with practitioners, to conduct rigorous studies, synthesize learning across contexts, and create shared knowledge about effective models and methods for transforming high school.

Employers, Community Organizations and Postsecondary Institutions that invest in and actively shape learning ecosystems to enable rich, relevant, experiential learning opportunities and robust, seamless pathways from high school to career.

In essence, we will partner with public policymakers, systems and institutions to support aligned efforts, as only a coordinated approach to R&D holds the promise to accelerate impact at broad scale.

From today through 2035, Carnegie will work across sectors and in partnership with educators to accelerate the learning and discovery described here. We have convened the Future of High School Network, launched in partnership with XQ Institute – a group of 24 pathfinding systems dedicated to learning together and building knowledge to accelerate high school transformation in rural, urban and suburban communities. As practitioners and policymakers develop and test approaches to move beyond time-based credit accumulation, Carnegie will synthesize and amplify emergent lessons and promising prototypes. In the year ahead, we will establish a national consortium of researchers and developers to speed particular aspects of the knowledge- and tool-building R&D Agenda outlined above. Over time, our aim is to build – for and with educators – a coherent portfolio of evidence-based guidance and carefully vetted tools, to accelerate the transformation of the American high school at broad scale.

THE MOMENT IS NOW

The persistence of an industrial-era education system in a post-industrial economy represents more than inefficiency – it constitutes an existential risk. It is a threat to our economy; it perpetuates inequality; and it limits human potential. We cannot accept systems that prioritize sorting over development, compliance over learning, or preparation for assessments over preparation for life.

The moment for transformation is now.

We have the knowledge, tools, demand and commitment to build something better. It requires the collective will to act with the urgency the moment demands.

This R&D Agenda is a road map for action. It acknowledges the complexity of educational transformation while providing a feasible set of priorities to focus resources and effort. Most importantly, it centers the voices and needs of students, families and communities in reimagining what high school can and should become.

The question is not whether we **can** transform American high schools – it is **whether we will choose to do so.** The students in our schools today deserve nothing less than our full commitment to building the educational system they need to thrive in the world they will inherit.

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ACKNOWLEDGMENTS

This work is powered by our partner, XQ Institute.

Expert Work Group

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Our Turn
Kevin Ervin*, former CEO
(now Chief Operating Officer at MA Impact Partners)

Learning Heroes
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National Parents Union
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Britte Haugan Cheng, Principal & Founder, and Timothy Podkul, Senior Insights Researcher; MenloEdu

Fiona Hollands, Founder & Managing Director, Ed Researcher

Tamara Rader, Advisor, James Lind Alliance

ACKNOWLEDGMENTS

Commissioned Papers and Additional Expert Consultation

Edge Research & Learning Heroes for their Research Synthesis on the High School Experience: Perspectives from Parents and Students.

Carla Evans for A Focus on Competency-Based Education, in collaboration with the National Center for the Improvement of Educational Assessment.

Laura Hamilton for Durable Skills from the American Institutes for Research.

Allison Metz for Co-designing a Research and Development Agenda for US High School Education: The Role of Implementation in Catalyzing Change, from the University of North Carolina School of Social Work: Collaborative for Implementation Practice.

Tim Podkul, Breniel Lemley, and Britte Haugan Cheng for Enablers, Barriers, and Critical Future Research to Support the Implementation of Student-Centered Learning Principles in Secondary Education, from Menlo Education Research.

The National Parents Union for Centering the Vision of Parents and Caregivers Towards Reimagining High School.

Viki M. Young, Mai Chou Vang, Zareen Kasad, Isabelle Acosta, and Alicia Frausto, with Cassie Graves, for Reimagining High School: Student Experiences Today, Hopes for Tomorrow, from Digital Promise: Center for Inclusive Innovation.

We also appreciate the valuable expert consultation provided by Joe Gisriel, Alejandra Ruiz, and Katherine Gu from Morning Consult.

Student Research Teams

Adapted Measure of Math Engagement research group. Principal investigator, Samantha Holquist; co-principal investigators, Diane (Ta-Yang) Hsieh, Marisa Crowder, Mark Vincent B. Yu, and Claire Kelley; research support, Avalloy McCarthy, Olivia Reyes, and Alyssa Scott; students, Salma Ahmed, Antonio Chavira, Brianna Espy, Ryan Ombongi, Serrah Ssemukutu, and Diamond Tony-Uduhirinwa; teachers, Nathan Earley, Karina Mazurek, Kathleen Morgan, Karla Rokke, and Ashly Tritch; and district staff, Marcie Coval, Julio Caesar, Betsy Hawes, and Rik Lamm. *https://www.childtrends.org/project/adapted-measure-of-math-engagement*

"Better Together" Youth-led Participatory Action Research (YPAR) project. Principal investigator, Daniela DiGiacomo; students from Allen County-Scottsdale High School, Kentucky, Haiden Brown, Gabrielle Corbett, Raelynn Donovan, Jonah Hamby, Jace Harper, and Alexander Stamps.

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Norma Ming, Alison Griffin (Whiteboard Advisors), Carla Cain-Walther, LaRena Heath, Jenna Hua, Angel Li, Kelly McMahon, Lauren Miller, Eli Pristoop, David Sherer, Emily Supple, and Tinkhani White.

This Research and Development Agenda was generously supported by the Walton Family Foundation.

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