



Proof Before Hype: Using R&D for Coherent AI in K-12 Education



Introduction

AI is moving faster than our ability to judge its fitness for teaching and learning. District leaders tell us they need decision-ready guidance tied to specific use cases, evidence from authentic classrooms, and guardrails that reduce risk while accelerating learning. This resource offers a practical way forward: **define quality by use case, evaluate transparently, and signal demand** so the market rewards tools that meet educator-defined standards. Invest in a trusted, instructionally grounded and nimble R&D ecosystem that empowers K-12 leaders to integrate AI ethically and effectively, ensuring coherent, equitable, and accelerated learning outcomes for all students.

Investing in this R&D ecosystem is not only an investment in educational innovation but also a strategic move to ensure measurable returns in student outcomes and long-term cost efficiencies for districts. The rapid proliferation of AI in K-12 education demands immediate, coordinated action. Without a robust R&D ecosystem, we risk widening inequities and stalling innovation. We need to make AI adoption **coherent** and **equitable**, providing the edtech market, including practitioners and developers, with the clarity it needs.

The Practitioner Signal: What Leaders Are Telling Us

Our insights on practitioner needs and desires are grounded in the experiences of district teams participating in the AlxCoherence Academy, an Education First initiative. The Academy is a 9-month program designed to support cross-functional district teams in defining the right problems before jumping to AI solutions, exploring AI's potential to enhance teaching and learning, and breaking down silos between departments to ensure AI is aligned and best practice is scalable. It's a multi-district initiative that helps school systems integrate AI in ways that strengthen, rather than disrupt, core instructional priorities. Leaders consistently emphasize:

- **Coherence First:** Tools must reinforce systemwide teaching and learning goals and priorities.
- **Use-Case Clarity:** Leaders require decision-ready guidance tied to *specific* uses (e.g., writing feedback, lesson planning, small-group differentiation), not generic ratings.
- **Transparent Fit:** Educators need clear alignment criteria, intended users, and guidance on *when not to use* a tool.
- **Continuous Feedback:** District pilots demand quick, trustworthy feedback loops between classrooms and developers, moving beyond one-off demos.

These practitioner challenges underscore the urgent need for an advanced R&D ecosystem, not just a single platform. We must connect proximate networks of educators, innovative laboratories capable of rapid testing, and policies that establish guardrails and signal demand.

An Advanced R&D Ecosystem Connects and Engages

- 1. Proximate Networks:** Cross-district, classroom-proximate educator and system leader networks that define *what quality looks like* for priority use cases and identify practical guardrails.
- 2. Innovative Laboratories:** Applied R&D labs that conduct rapid, ethical trials in authentic settings, generate trusted evidence and methods, and publish transparent evaluation artifacts linked to instructional coherence.
- 3. Forward-Thinking Policy:** Policy that standardizes disclosures, protects students and educators, funds comparative trials, and aligns procurement with educator-defined quality. ALI plays a crucial role in advocating for and shaping these policies to safeguard students and educators while fostering innovation.

Call to Action

This is a pivotal moment for K-12 education. We call on all stakeholders to actively shape the future of technology in the classroom.

Recommendations for Developers

Developers must invite practitioners and researchers in as co-designers—to design for “fit and fidelity,” to ensure products meet educator-defined, evidence-based standards, and to sunset those that don’t work. By actively participating in a reimagined practitioner-grounded R&D ecosystem, edtech providers gain a significant competitive advantage. Products that demonstrate transparent, educator-defined quality will receive clear market signals, leading to increased adoption and trust from districts. Recognizing that districts often prioritize tools within existing platforms, we encourage developers to design for interoperability. This includes providing clear APIs, adhering to common educational data standards, and ensuring seamless integration with widely used K-12 technology stacks to minimize implementation barriers for schools.

Build Shared Practitioner-Driven Definitions of Product Quality

The lack of agreed-upon standards and conflicting vendor claims leaves leaders guessing. A shared definition, anchored in instructional use cases, will establish common language and guardrails. The rapid adoption of generative AI in K-12, coupled with a lack of trusted guidance, makes this more urgent than ever. If systems and states prioritize coherence and learning value, the market can follow. Developers create tools and solutions for defined use cases.

Proximate Networks	Convene cohorts of educators and local education agency (LEA) and state education agency (SEA) leaders by use case (e.g., writing feedback) to draft and validate criteria (e.g., alignment to HQIM, measurement of learning, workload impact, equity safeguards). Aggregate demand around priority use cases and criteria, publishing common procurement standards and frameworks.
Innovative Laboratories	Translate criteria into observable indicators, create short test protocols, and publish evidence snapshots or briefs that are shareable across districts. Offer structured co-design sprints, sharing API/UX requirements that enable fidelity within real workflows.
Policy Levers	Require plain-language model/feature disclosures, data protections, and fit-to-use-case attestations in RFPs and RFIs. Tie funding, procurement, and accountability to educator-defined standards, enabling districts to buy for fit, not just features.
Market Signal A transparent, evidence-based learning ecosystem and shared criteria will provide much-needed clarity in a market currently overwhelmed by frameworks and tools without a central point of reference, enabling districts to adopt tools and solutions with confidence. Aligned, informed demand enables greater alignment around quality, which increases adoption of tools that meet rigorous standards, fostering a more effective market.	

Recommendations for the Field

Systems Leaders and Practitioners: Join proximate networks by priority use case, shape and adopt the shared definition of quality, and actively participate in co-designing trials and defining success thresholds to require transparent fit-to-use-case evidence.

Funders and Policy Leaders: Underwrite rapid, ethical trials; standardize disclosures; and align procurement to educator-defined quality by funding comparison studies and establish a set of guardrails to support quality and mitigate risks:

1. **Coherence Guardrail:** No tool adoption without explicit mapping to system-wide teaching and learning goals, data systems and needs, and the existing workflow.
2. **Equity Guardrail:** Evidence of access and subgroup effects; publish bias and accessibility checks.
3. **Safety/Privacy Guardrail:** Clear data flows, model disclosures, and opt-out paths for educators and families.
4. **Use-Case Guardrail:** Every product should have a “do use / don’t use” page and prerequisites for fidelity.
5. **Evidence Guardrail:** Comparative results or defensible proxies; rapid re-checks as models update.

Create a Trusted, Transparent System to Evaluate Tools Against Product Quality Definition

Existing reviews are often siloed and not decision-ready. Leaders need clear, comparable evidence tied to real contexts.

Proximate Networks	Co-design side-by-side trials, defining success thresholds and “red lines” (e.g., hallucination tolerance by task).
Innovative Laboratories	Run rapid, school- and district-embedded evaluations, reporting where the tool fits, when it fails, and what fidelity requires.
Policy Levers	Fund comparison studies, standardize reporting formats, and require “when not to use” guidance in adoption artifacts.
Market Signal Increased adoption of tools with transparent, use-case-tied evidence and clear guardrails will move the market towards positive student impact.	

We're advocating for something beyond a single platform or solution. We propose an ecosystem that fosters continuous, valuable, and trusted evidence, upon which the market can build. This collaborative, evidence-based approach has the potential to improve student outcomes and to facilitate equitable adoption of AI across K-12 education. Together, we can not only address immediate challenges but also establish a scalable, sustainable framework for continuous improvement nationwide.

Questions, thoughts or feedback? We want to hear from you! Reach out to contact@alicoinition.org.

About the Advanced Education Research & Development Fund

[Advanced Education Research & Development Fund \(AERDF\)](#) is a national nonprofit that unlocks breakthroughs in science and applies cutting-edge technology to solve the most pressing teaching and learning challenges in PreK-12 education. Through our Advanced Inclusive Research and Development (R&D) model, we unite educators, caregivers, learners, scientists, and technologists to conduct high-risk, high-reward R&D that evolves with the pace of artificial intelligence and systemic complexity, ensuring the field can anticipate change rather than react to it. We build the infrastructure, partnerships, and momentum needed to move discoveries from idea to impact, so every student can thrive in a rapidly changing world.

About the Alliance for Learning Innovation

The [Alliance for Learning Innovation \(ALI\)](#) believes that more effective, rapid, and strategic education research and development (ed R&D) is essential to helping educators successfully address the most pressing obstacles to student learning today. Our diverse coalition works at the federal and state levels to build the conditions for a more effective, innovative, community-centered education research and development (Ed R&D) movement – one that eliminates opportunity gaps, accelerates learning, and ensures our nation's continued path to economic prosperity and competitiveness.

About Education First

[Education First](#) is a seasoned team of trusted advisors to the leaders responsible for delivering what many Americans want most: public education that effectively prepares all students for success in college, careers and a world of constant change. We devote our energy and expertise to improving opportunities for all children, especially students experiencing poverty and students of color.