



The Tech-Powered Instructional Core

A Vision, A Test, and What It Will Take
to Activate It Across New York City

FALL 2024

 **CPRL** | Center for Public
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 COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

The Tech-Powered Instructional Core |

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» Executive Summary

The 2020s—marked by the COVID-19 pandemic and the advent of generative artificial intelligence (AI)—reared a new model for learning: the tech-powered instructional core. Unlike the traditional instructional core, which involved an educator (i.e., a classroom teacher), a student, and physical instructional materials (e.g., books, curricula, or worksheets),¹ the tech-powered instructional core consists of an educator (in some cases, a traditional classroom teacher), a learner, a family member (or another member of the learner’s support system), and tech-infused, high-quality instructional materials.

Together, the four points of the core dynamically drive learning: *Imagine, for example, an elementary classroom where in one corner, high-quality instructional materials guide student-led discussion focused on a grade-level, culturally-responsive text. In another corner, students engage with a digital platform to strengthen foundational skills, with AI continuously adjusting substance to match needs. Based on student data, families receive personalized Science of Reading-based guidance to support their children at home. Monthly, teachers welcome families to the classroom to offer feedback on how learning can be better tailored to students’ academic needs and cultural experiences. Overall, the literacy environment extends beyond the four walls of the classroom, leveraging the power of technology and human experience to make learning rigorous, personalized, and captivating.*

Though powerful, the tech-powered instructional core is far from ubiquitous across New York City (NYC). Well-resourced schools often bring this model to life, while schools serving students and families living in poverty may struggle to do so. Without focused attention, tech-driven shifts to the education landscape risk deepening NYC’s educational inequities, as opposed to helping ameliorate them.

» Executive Summary *cont.*

In 2023-2024, the [Center for Public Research and Leadership \(CPRL\)](#) and the [Robin Hood Learning + Technology Fund \(L+T\)](#) worked with 20+ NYC-based systems, schools, and organizations (together comprising the “Cohort on Tech-Powered Family Partnership”) to design, test, and measure new ways to activate the tech-powered instructional core—particularly for students and families living in poverty. These efforts helped to distill five practices and approaches for the field to “stop” and “start (or expand)” in order to activate the tech-powered instructional core across the NYC educational ecosystem.

- Stop working in **silos**; instead, **cultivate cross-functional approaches** that bring together systems, schools, ed tech, and community-based organizations (CBOs) to activate all points of the tech-powered instructional core.
- Avoid assumptions that families are **too busy or burdened** to support learning; instead, recognize that **all families can, do, and want to support their children’s learning**.
- Stop using **one-dimensional approaches to family engagement**; instead, partner with families to create **varied, asset-based opportunities** to support learning.
- Reject worries that tech-infused learning means **abandoning traditional methods** that work; instead, embrace **nuanced, flexible** approaches to **tech-infused learning that leverage human connection**.
- Let go of the myth that **COVID-19 resolved the digital divide**; instead, **extend physical access** to devices and WIFI, and work to make tech-infused platforms accessible (e.g., by ensuring availability in families’ home languages).

The remainder of this brief elaborates on the tech-powered instructional core model, offers examples of how organizations within the Cohort on Tech-Powered Family Partnership are putting it into practice, points to key challenges they are navigating, and begins to demonstrate the potential of the tech-powered instructional core to make our education system more cohesive, responsive, and democratic.

» Introduction

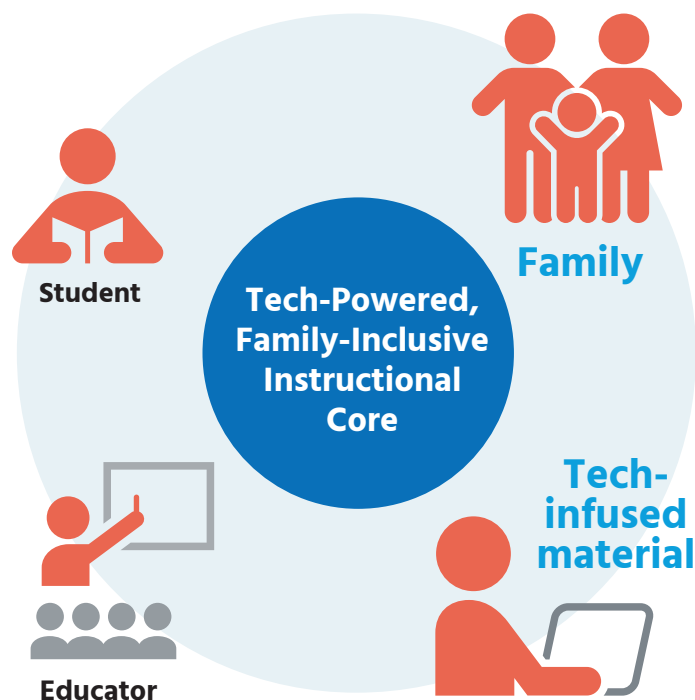
To date, many conceive of learning as occurring in a closed system—sometimes called the instructional core. That system consists of an educator (i.e., a classroom teacher), a student, and instructional materials (e.g., books, curricula, or worksheets).¹ Using this model, learning happens largely because information and skills flow from instructional material to teacher and then from teacher to student.

The 2020s, characterized by the COVID-19 pandemic and widespread access to generative artificial intelligence, have changed all that. The concept of a classroom with a closed door—where students receive knowledge from a single teacher, who leverages a limited set of physical materials—is the exception, not the norm. For today’s students, learning is far more open. Open to technologies that offer access to information, personalized support, and rapid feedback. Open to community members and families who bring refreshing knowledge, resources, and strengths to inform what is taught and how.² Open to high-quality instructional materials whose developers make content freely and readily available and are constantly adapting in response to user feedback.



» The Vision

In short, the instructional core has changed. Improving schooling requires shifting this model to match the evolving context of teaching and learning. The traditional instructional core, consisting of three stationary components with a one-way information flow—from material to teacher to student—no longer dominates. Instead, we imagine the **tech-powered instructional core**, consisting of an educator (in some cases, a traditional classroom teacher), a learner, a family member (or another member of the learner’s community support system), and tech-infused, high-quality instructional material. Each of these leverages technology to improve instruction, learning, and communication across the core.



What are high-quality instructional materials, and what does it mean to infuse them with tech?

High-quality instructional materials are learning materials that have “specific learning goals,” “lessons aligned to content standards, student-centered approaches to inquiry-based learning, research-based teaching strategies, teacher support materials, and embedded formative assessments to effectively help teachers implement instructional units and courses that are integrated, coherent, and sequenced.”¹⁸ High-quality instructional materials are also educative, that is, they help users (e.g., teachers or families) learn to better guide student learning.

Many of these curriculum developers have leveraged technology to make their materials more accessible and more personalized to student needs. Many provide digital access to materials and instructional videos to support educators, students, and families. Some also provide student-facing learning and assessment platforms that gather data on students’ progress and individualize learning activities to match their needs.

The tech-powered instructional core is **permeable**. It is receptive to new contributors to learning, including information, support, and feedback that students, teachers, and families gather from the digital or physical world. These sources might include generative AI, members of the surrounding community, and elements of the physical environment. Additionally, the tech-powered instructional core is **multidirectional**; the model accounts for the possibility that learning can occur across various channels within the core.

The vision of the tech-powered instructional core holds singular promise for a more equitable education system.

- Embedded in the vision is the idea of **ongoing learning and improvement**. Rather than assuming they have found an answer or fully solved a problem, educators and learners remain open to the reality that there is always more to learn and seek opportunities to strengthen their efforts.
- The vision offers opportunities for more **individualized learning** if we leverage technologies that let us identify and address unique student—and educator—learning needs.
- The vision has the potential to help students see their local and digital environments as valid sites for learning, enhancing their **sense of belonging in academic spaces** and the cultural responsiveness of their education.

» The Vision *cont.*

- The vision offers possibilities for strengthened **educator-family-community relationships** by making the most of technologies that allow for two-way communication in the languages families speak and read and by inviting in community organizations that families trust.

However, if education systems do not place strategic focus on activating this model for **all our children**, the technological and societal shifts of the early 2020s will only deepen inequities. Affluent systems, schools, families, and communities will be positioned to advocate for this open model of learning. They *already* connect with strengths in their communities, leverage technology to personalize learning, and support students to expand their learning beyond the classroom and into their physical and digital worlds. Meanwhile, schools, systems, and families of historically marginalized students may suffer from inertia or, worse, use new educational technologies in ways that further entrench racial and socioeconomic biases and cause cultural harm.

To that end, as the largest and one of the most diverse school systems in the nation—and one of the most segregated—New York City must learn what it will take to activate the tech-powered instructional core for all learners, educators, families, and communities. The need is here—now.

Does this mean families must become instructional experts?

No. When some people hear about families as anchors of the tech-powered instructional core, they worry that this means that families must transform into computer science, AI, or Science of Reading experts overnight. This is not the case. Rather, we aspire for an educational environment in which families support learning in a variety of ways that align with their strengths and needs.

Does this mean we must do away with all low-tech learning?

No. Others worry that activating the tech-powered instructional core means that all low-tech learning sources and experiences—like treasured books, interactions with the outdoor environment, or person-to-person conversation—must be left behind. As we'll explain, digital-only materials might work in some scenarios, but in most, digital tools should be used strategically alongside low-tech methods that work to enhance or extend learning.

» The Test

Embedded in the vision above is the assumption that various community actors, not just schools, must work together to activate the tech-powered instructional core. With a robust ecosystem of actors who have potential to support (and in many cases, are already supporting) the tech-powered instructional core, New York City is positioned to advance this vision.

School system actors, such as the New York City Public Schools (NYCPS) Office of Family and Community Engagement and the family-facing governance bodies they support—for example, the Panel for Educational Policy—provide direct-to-family resources and platforms to help families shape citywide policy decisions. Schools serve as the first touchpoint for learning for many families and provide guidance on how families can support their children. Community-based organizations (CBOs) provide families and children with wellness services, support in navigating school system complexities (such as the Individualized Education Program process), and more, and they partner with schools to deliver tech-infused learning. Developers of high-quality instructional materials equip schools with tech-driven opportunities to personalize student learning and more deeply engage families.

Still, none of these actors could single-handedly activate a rich and complex model like the tech-powered instructional core for all New York City educators, students, and families. Instead, the vision requires that actors collaborate, leveraging their collective strengths (e.g., broad reach, political power, relationships and trust with individual families, instructional and technological wherewithal) to maximize the potential of the model.

To understand what it might look like to more strategically activate the tech-powered instructional core in New York, and to explore how diverse ecosystem actors might—together—strengthen it, the Columbia University [Center for Public Research and Leadership](#) (CPRL) brought together more than 20 organizations from across the city's ecosystem to join the Cohort on Tech-Powered Family Partnership, a collaborative committed to developing, testing, measuring, and strengthening strategies that they believe can advance the tech-powered instructional core.

Cohort on Tech-Powered Family Partnership

Association to Benefit Children:
Study Buddies Connect

Barbershop Books

Blossom

CSforAll

DIVAS for Social Justice

Energy Tech High School

Geeks Rule

The GIANT Room

KIPP NYC

League of Young Inventors

LINC (Literacy in Community)

LIFE (Literacy Is a Family Experience)

Literacy Trust

Makeosity

NYCPS Department of STEM

New York Hall of Science

The New York Public Library

REACH Family and Education Center

Springboard Collaborative

Start Lighthouse

S.T.E.A.M. Champs

STEM Educational Institute



» The Test *cont.*

A number of the strategies being explored are referenced in the recommendations below. This work is part of a larger CPRL effort to elevate effective practices related to family-school partnerships and to expand access to those partnerships in New York and beyond.⁴

The cohort includes NYCPS system actors, public schools, and an array of CBOs (e.g., a central office from a major library system, a community-focused museum, nonprofits that provide instructional materials and support in-school learning for teachers, students, and families, and organizations that support students' out-of-school learning). **To some extent, the group functions as a microcosm of the city's broader ecosystem with the potential to support the tech-powered core.**

In addition to robust, ongoing individual work to build and test strategies to activate the core in their contexts, this group has come together each quarter for the last several months to refine our understanding of the problems we aim to solve, to gather feedback, and to explore opportunities for collaboration among system-level actors, schools, and CBOs.

» How Can Systems, Schools, Families, and Communities Activate the Tech-Powered Instructional Core?

| Recommendations

In addition to building and testing their own strategies, the efforts of the Cohort on Tech-Powered Family Partnership have illuminated several tactics and mindsets that will help the field advance the tech-powered instructional core in New York City.



» **Stop:** Siloed approaches, in which systems, schools, and CBOs operate alone and thus activate only some components of the tech-powered instructional core.

The tech-powered instructional core is a complex model. It requires the coming together of individuals and resources that have long been thought to function in their own realms. Schools and CBOs may operate separately even though they serve the same families. Therefore, they may miss chances to strengthen one another. Schools may have limited relationships with NYCPS's central office, missing chances to scale effective practices. Ed tech companies and developers of high-quality instructional materials may not understand the needs and inner workings of hyperlocal community-based organizations that serve children and families, missing chances to expand tech-infused learning and make their products more accessible. Families may feel vulnerable when engaging with academics, particularly when faced with new instructional approaches and technologies that look little like what they experienced in the classroom. For the tech-powered instructional core to work for all New York City children, we need all of these actors to work together.

» **Start (or expand):** Cross-functional and cross-organizational efforts to activate all components of the tech-powered instructional core. To activate the tech-powered instructional core, the city needs robust collaboration among actors who support learning from different angles. CBOs who have trusting relationships with families need to welcome families into these efforts, in and out of schools. Ed tech and high-quality instructional materials developers need

to continue learning from users about how to simplify and improve their products to meet educator, family, and student needs. NYCPS's central office needs to ensure efforts can roll out at scale. In short, actors need to maximize the skills and strengths that others bring to the tech-powered instructional core. All parties need to quickly share diverse kinds of knowledge. Members of the Cohort on Tech-Powered Family Partnership are exploring what these cross-organizational efforts might look like. For instance, New York Hall of Science, a science museum in Queens, designs its community programming based on feedback from families, school leaders, and district leaders in an effort to strengthen the family-school-community connection.



» **Stop:** Perceptions that families are too burdened to support learning. A threshold question that surfaces in conversations on family-school partnership is whether this partnership is a reasonable request for busy families. Some say that many families need to address fundamental wellness needs (e.g., healthy food, housing) before they can focus on children's learning, and that welcoming families to engage in academics might impose unsustainable demands on families already facing immense burdens.

These concerns are valid and grounded in the real challenges New York City families face. But the mindset makes an unfair assumption about what families can and want to do. Regardless of race, academic background, or socioeconomic status, families

» How Can Systems, Schools, Families, and Communities Activate the Tech-Powered Instructional Core? | Recommendations *cont.*

want to be—and are—part of their children’s academic lives.⁵ The “benevolent bias”⁶ behind the assumptions that some families are too burdened to participate in learning risks perpetuating the all-too-common scenario in which affluent, English-speaking white families are included in learning but low-income families of color who speak other languages are excluded. To activate the tech-powered instructional core, we need to shift this mindset into one that sees all families as academic partners, bringing diverse funds of relevant knowledge and strengths.

» **Start (or expand): Recognition that all families support their children’s learning.** Even if families want support to meet wellness needs, they cannot be passed over as partners holding knowledge and assets that can strengthen learning. To help New York’s ecosystem activate the tech-powered instructional core, schools and CBOs might consider a “both and” approach, in which educators simultaneously support families in addressing wellness needs and partner with them around tech-infused learning. For instance, cohort member REACH Family and Education Center provides multigenerational programming that allows families and children to engage in sessions that meet their needs (e.g., caregivers attend a workshop on English-as-a-second-language, children engage in tech-infused literacy learning activities). Cohort member Barbershop Books provides children with book access, mentorship, and free haircuts in barbershops, activating community resources to help families drive their children’s learning while meeting a wellness need.



» **Stop: One-dimensional approaches to family engagement in learning.** Families bring incredibly diverse needs, strengths, and goals to their children’s learning, but too often they are offered only one option when it comes to engagement that may not align with those needs, strengths, and goals (e.g., to participate in a parent-teacher conference during the school day, to join a science workshop conducted in English). Families need options and choices when it comes to partnership, and the tech-powered instructional core can help make more of those available.⁷

» **Start (or expand): Varied, asset-based roles that families can choose from to support learning.** Our cohort members are testing, refining, and improving opportunities for families to play a variety of the asset-based roles below.

- **Coproducers of learning.** When children are young, some families want to directly coproduce learning. Families might learn the skills for effectively reading aloud or unpacking the technical phonics concepts their children must understand to read well. Several cohort members engage families as coproducers of learning. For instance, Springboard Collaborative has historically supported schools to build literacy “teams” for each student—consisting of a family member, a child, and a teacher—who implement a 10-week instructional plan, upskilling families to coach their children at home using Science of Reading techniques. Through our cohort work, Springboard has tested virtual synchronous and asynchronous versions of this model to explore how to strengthen families’ participation and support students’ literacy development.
- **Colearners.** Other cohort members are testing colearning opportunities, in which families learn alongside their children. For instance, the League of Young Inventors, an instructional materials developer and professional learning provider focused on engineering design and computational thinking, has tested short, highly visual ClassDojo communications to help families learn about concepts that students are exploring in school, deepening understanding and enthusiasm for STEM at home. As colearners, families need not bring or develop an educator-adjacent skill set. They come as they are but still play a key role in the instructional core, as models of academic habits like intellectual curiosity.
- **Navigators.** Some cohort members are exploring how to support families as navigators or brokers. According to Hive Research Lab, the idea here is to support children’s “long-term, interest-driven learning across settings.”⁸ Given their knowledge of their children’s skills and interests, families are well-positioned to fill this role, nurturing the progression of a student’s exploration from interest to hobby or career. For example, cohort member Geeks Rule, a nonprofit providing STEM afterschool programming, is planning to test the impact of providing families with concise information to help them identify affordable next steps for students looking to deepen or expand their STEM interest (e.g., by identifying and applying to STEM-focused high schools or by identifying other local STEM-related resources).

» How Can Systems, Schools, Families, and Communities Activate the Tech-Powered Instructional Core? | Recommendations *cont.*

- **Advocates or Advisors.** Families might also serve as academic advocates or advisors for the educators and organizations that serve their children. When equipped with information about what is possible with respect to student learning experiences, and offered opportunities to participate in school, system, or organizational decision-making, families are powerful agents for improvement.⁹ For instance, Barbershop Books, a nonprofit that supports boys of color to identify as readers, is testing AI-enabled ways to equip families with knowledge of their children's reading preferences, so families can advocate for reading experiences that match those preferences in and out of school.

Notably, most cohort members have built these engagement opportunities based on data gathered from families about the ways in which they want to engage. This suggests that even before developing opportunities for families to play these diverse roles, schools, systems, and CBOs need to learn how families *want* to engage in their children's learning, and then craft opportunities based on those data.



- » **Stop:** The notion that tech-infused learning means letting go of traditional learning methods that work. To many New York City families and educators, the need for tech-infused instruction and its power for their children is plain. Some families and educators push tech-infused learning for its power to prepare students for the job market in a tech-dependent world. Others value its power to provide personalized learning support and feedback based on students' needs or interests. Still others find it allows for deeper family engagement—enabling virtual communication, instant delivery of student data, and translation.

For others, past negative experiences with technology stand in the way. Even rigorous instructional technologies can be associated with the difficult pandemic-era learning experiences, excessive screen time, or social media–induced mental health challenges among young people.¹⁰ Many worry that tech-based learning will replace human interaction and meaningful use of print texts and other physical learning materials.¹¹

- » **Start (or expand):** Nuanced, flexible approaches to tech-infused learning that leverage human connection.

Those who are hesitant about technology—as a topic and medium for learning—might take some cues from students. For young people, the question of whether to use technology for learning or study it substantively is moot; technology is part of their lives. A central office staff member from The New York Public Library echoed the notion: “E-reading comes up a lot for us. . . . With older populations, they often approach e-reading as, ‘I’m leaving books behind and going digital.’ That’s not how kids approach it. They use different mediums for different things. They process the information that they’re consuming in different ways.” In other words, the tech-powered instructional core requires us to make decisions about when to use and study technology, not to simply and completely ‘go digital.’

This idea isn't new. The *Triple E Framework* developed Professor Liz Kolb at the University of Michigan Marsal Family School of Education, still makes the point well: Technology should be integrated into learning substantively and as a medium, when it supports engagement, enhances learning, or extends learning beyond the boundaries educators originally imagined.¹² For instance, cohort member LINC (Literacy in Community) offers in-person family workshops and traditional storytime programming that uses print books at in-person settings to support family-child bonding and literacy development. But, it also offers family workshops virtually to extend reach, as well as digital read-alouds in multiple languages (some with thousands of views on YouTube).



- » **Stop:** The notion that the COVID-19 pandemic bridged the digital divide. Beyond mixed attitudes about the role of tech in learning, tech access—plain and simple—remains a challenge for the tech-powered instructional core. Some have suggested that the pandemic narrowed digital literacy gaps¹³ or that most households obtained devices as school systems went “one-to-one.” But access remains far from equal in New York City.

First and most fundamental, the digital learning platforms that might engage families and students are not consistently available in the languages families speak and read. For example, IXL—an



» How Can Systems, Schools, Families, and Communities Activate the Tech-Powered Instructional Core? | Recommendations *cont.*

interactive learning platform offering microlessons and short assessments that reportedly reaches one in four New York students¹⁴—is available only in English and Spanish (in its United States version).¹⁵ In addition, many families lack digital literacy skills and are sometimes asked to interact with more than a dozen digital platforms to help their children with learning.¹⁶ Moreover, internet and device access in New York continues to vary dramatically across racial and socioeconomic lines. Many low-income families and families of color remain dependent on smartphones for internet access, despite NYCPS attempts to distribute devices with hot spots.^{17,18,19,20}

» **Start (or expand): Access to Wi-Fi, devices, and learning platforms in the languages families speak.**

To activate the tech-powered instructional core, the city needs digital platforms—to support families as partners in learning—that are available in the languages families speak and read. Although far from a cure-all, communication platforms with automatic translation (such as WhatsApp and ClassDojo) are helping cohort members engage with families in their preferred languages. One cohort member, Blossom, is testing an e-reading platform that enables families to read a single text in multiple languages. The goal is to strengthen the home-school connection for multilingual families.

In addition to the proliferation of tools that enable families to support learning in languages they speak and read, the ecosystem should bolster opportunities for families who may not read or write in their home languages or who may need support with digital literacy skills.

Lastly, the city must work to enhance access to devices and the internet. (Some ecosystem actors note that those looking to increase family partnerships in children’s learning could begin by simply supplying digital infrastructure.) The city must also find better ways to share existing devices (e.g., by ensuring that academic afterschool and summer programs can take advantage of devices borrowed from NYCPS) and explore forms of family partnership that do not rely on at-home device access. Importantly, providing equitable access in this area will take time. As ecosystem actors work to increase digital access, schools and CBOs should continue to work and learn in the pockets where access exists, so they can expand access with greater information about what works for children, educators, and families.

» Moving Forward

It's a tough moment for school systems. Public school enrollment is declining nationwide. Teacher shortages persist. For most, ESSER funding has expired. Meanwhile, schools continue to struggle to make up for the learning gaps that emerged during the pandemic and educators face new and complex decisions as to how to safely and effectively make use of emerging technologies in classrooms. Traditional modes of instruction and family engagement are growing increasingly outmoded.

Yet, in NYC, the focus on high-quality instructional materials and safe, strategic use of instructional technology has never been stronger. NYC Reads—focused on ensuring all NYCPS students become strong readers—has enabled widescale rollout of high-quality, digitized reading curricula. NYC Solves will support a similar effort in math. NYCPS is proactively partnering with stakeholders to draft guidance to help all NYCPS students develop AI literacy and to better understand how AI can support teaching and learning. Moreover, in addition to the cohort members above, dozens of NYC-based CBOs currently support families as partners in their children's learning in and out of schools. In short, as an ecosystem, we have the energy and capacity to make the tech-powered instructional core a reality for all of our students, making sure every student has a learning experience that extends beyond the four walls of their classroom.

Now, it's a matter of bringing these drivers of the tech-powered instructional core together, with the conviction that the whole will be greater than the sum of the parts.



Want to learn more about the NYC ecosystem of actors supporting the tech-powered instructional core?

CPRL has studied the work of dozens of organizations that support families as partners in learning and leverage technology to do so. To learn about their programs, the geographies where they operate, and more, email cpri@law.columbia.edu.

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