



DEEPER LEARNING NETWORKS SERIES

Deeper Learning Networks

Taking Student-Centered Learning and Equity to Scale

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with DeAnna Duncan Grand, Martens Roc, and Peter Ross

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Executive Summary

For decades, progressive educators have sought to transform schools and systems in ways that allow more student-centered and inquiry-driven approaches to flourish and that improve learning for the country's most vulnerable youth. In recent years, schools have sought to develop what have been called "deeper learning" approaches, which are designed to allow students to apply their knowledge to new situations and complex problems of the sort they will experience outside of school. Enacted through project-based learning, work-based learning, and performance assessments, these inquiry-based approaches help students learn to think critically, collaborate, and communicate, within and across the disciplines, using mathematical, scientific, historical, and creative reasoning that enable students to "learn how to learn" and develop mindsets that increase perseverance and productive learning behaviors.

Many educators have created successful innovative models but have had difficulty sustaining, re-creating, and scaling these models. Classrooms and schools characterized by student-centered learning practices typically deviate from the norms of transmission teaching and the many structures and procedures that David Tyack and Larry Cuban called the "grammar of schooling." As a result, these schools have confronted institutional and normative obstacles as they seek to implement and spread high-quality models and practices with fidelity.

Given the elusive nature of change, this study investigated several networks of schools that had successfully instantiated, sustained, and spread progressive educational practices in ways that advance equity and produce greater success for traditionally marginalized students. It then considered the systems and structures that practitioners have used to anticipate and overcome the challenges that often accompany efforts to enact and spread deep changes to teaching and learning.

We examined three school networks, all of which engage students in inquiry-based learning that has resulted in positive outcomes for students, most of whom are students of color from low-income families:

- Big Picture Learning, which offers an experiential and interest-based learning approach grounded in personalized, transdisciplinary courses of study and workplace learning that typically takes place in internships;
- The Internationals Network for Public Schools, which serves newcomers with an "activity-based" pedagogical model that features collaborative, inquiry-based learning for English learners who have had widely variable levels of education before coming to the United States; and
- New Tech Network, which offers a whole school model grounded in interdisciplinary, project-based learning that is technology supported, including resources for both teachers and students to facilitate collaborative learning.

Especially in teaching diverse learners, these approaches require sophisticated pedagogies that many teachers have never experienced or learned to enact in their classrooms.

Findings

In this study, we investigated how these organizations have instantiated and re-created their unique models across the country, thus increasing access to deeper learning for a much wider range of students, including marginalized economic, racial, and linguistic groups. Through an analysis of qualitative data sources, the report shows that Big Picture Learning, Internationals, and New Tech Network share common systems that have helped to instantiate their deeper learning school models in new settings.

1. The networks design schools and secure the necessary structures that allow deeper learning to flourish in network-affiliated schools in local districts.

Big Picture Learning, Internationals, and New Tech Network intentionally design schools for deeper learning and rethink the structures surrounding teachers' work, the use of time in schools, and the ways in which students demonstrate their progress. These school design features, often discussed as prerequisites for entering local partnerships with districts, include creating schools that allow for interdisciplinary learning and teacher looping, as well as for flexible schedules that allow ample time for teachers and students to engage in collaborative and applied learning. In addition, networks work to find ways that allow students to earn credits as they engage in real-world tasks and performance assessments. To build schools with these structures, the networks actively seek to secure policies and conditions that enable their models to take hold.

Networks also design schools that attend to students' social, emotional, and academic needs. By creating schools that allow for advisories and the provision of services to meet students' diverse needs, Big Picture Learning, Internationals, and New Tech Network design schools that surround students with the systems of support that enable their learning and well-being.

2. The networks collaborate with local stakeholders to establish and sustain their deeper learning models, thus building collective investment in the model and enhancing school capacity.

While the three networks advocate for conditions that allow their models to flourish in districts, they do not establish or sustain their schools in a unilateral manner. Instead, each network collaborates formally and informally with district leaders, site-based educators, and community members to ensure that their models are a good fit for student and district needs and that their models are welcomed rather than imposed transformations. Once established, network and school leaders continue to build relationships with district, community, and external partners to build community investment in the model and to extend the school's capacity to support students in deeper learning.

3. The networks build and maintain multifaceted systems of professional learning that ensure that educators are continuously supported in enacting deeper learning.

Because many teachers are underprepared to implement deeper learning, Big Picture Learning, Internationals, and New Tech Network have built professional learning systems that create opportunities for practitioners to learn and experience deeper learning in ways that build and reinforce their knowledge.

Each of the networks implements network-wide gatherings to introduce teachers to the foundational features of their approaches. They also facilitate visitations to network schools where educators not only can learn how to enact the network model but also can see the

power and potential of these approaches firsthand. Notably, teachers typically engage in these professional learning experiences in ways that mirror how students learn in their networks, strengthening their understanding of deeper learning and the student experience.

All three networks also provide their teachers with ongoing supports, including access to expert coaches who address pressing issues as they emerge in the implementation of deeper learning pedagogies and to resource repositories that include curriculum and assessment models. Coaching is carefully scaffolded so that intense support is gradually reduced as in-school capacity is developed, leaving the school with strong internal capacity for the work.

4. The networks invest in leadership development to support site leaders in designing and sustaining schools for deeper learning.

Networks have also developed and maintained systems that support leaders in designing and sustaining deeper learning, which has helped them to instantiate and grow their models in high-quality ways. Each network invests in leadership development before a principal assumes the helm of a network school—engaging new site leaders in targeted professional development, intra-network visitations, and coaching sessions. Networks also engage principals in ongoing professional learning through continued access to coaches, professional development, and participation in more informal communities of practice.

Often, leaders of new schools have been teachers or leaders in existing network schools, so they have personally experienced the system designs and pedagogies needed. To support the process that allows “network DNA” to be transferred to their various locations and new sites, the networks create leadership pipelines. By immersing both teachers and leaders in reinforcing, collaborative, and experiential professional development, they create a workforce that can successfully instantiate their deeper learning and equity-oriented models in new and existing sites.

5. The networks and their affiliated schools are learning organizations that continually improve their designs to ensure quality and equity.

As the networks have grown, they have encountered challenges related to meeting the learning demands of a growing workforce and a diverse student population. All three networks have turned these growing pains into both formal and informal opportunities for reflection and improvement. By maintaining a learning orientation, the networks have evolved in their practices, allowing them to adapt their approaches in community-responsive ways while maintaining fidelity to their models.

Implications

Through these systems and structures, Big Picture Learning, Internationals, and New Tech Network have been able to spread and replicate their deeper learning models in context-sensitive ways, allowing them to grow and sustain their organizations in partnership with local communities. Their practices elevate important lessons. Among these are insights that can inform districts and schools seeking to expand access to deeper learning and equity in a wide range of settings:

- **School design and pedagogy are intimately linked:** Deeper learning pedagogies require other structural changes that reorganize time and relationships within schools, including those that enable long-term relationships between teachers and students (e.g., through looping and advisories), those that permit longer blocks of time for project-based

learning inside the school and interest-based internships in the community, those that allow teachers to work collaboratively in teams, those that support authentic assessments within and across classrooms, and those that provide the additional academic and social-emotional supports students need to succeed. Pursuing changes in pedagogies without pursuing new school designs is unlikely to succeed in producing sustainable models with strong outcomes.

- **Every member of the school community must learn deeply about the new approaches and why they matter** in order to make decisions and contributions that sustain these approaches: In addition to teachers and school leaders, central office leaders, school board members, teachers unions, parent and community groups, and local businesses need to understand deeply what new models of practice are seeking to accomplish and how they intend to do it. Each stakeholder has a key role to play in enacting and sustaining the changes over time.
- **Developing the sophisticated pedagogies needed to teach for deeper learning with equity requires new approaches to professional learning:** After-school workshops are not enough. Strategies include cross-school conferences and scaffolded coaching for leaders and teachers; observations of successful schools and classrooms; residencies; and curriculum supports, such as unit and lesson plans and authentic assessments. With these approaches, teachers can build on the tools that expert teachers have developed and then adapt them to their needs. Educators thus have the opportunity to learn in ways that model the deeper learning they seek to create, that demonstrate models and artifacts of practice that they can observe and emulate, and that build continuous collaboration in communities of practice.
- **School leaders must have significant knowledge of learning and successful experience in the new model** to be able to redesign the school and help enable the innovative practices it requires: If leaders do not understand both the pedagogies and system supports needed, they will struggle to create the environment needed for teachers to teach deeply and the supports needed for a wide range of students to learn in ways traditionally reserved for a small, select group of students.

This study has suggested how to plant and grow new approaches that move beyond traditional constraints to provide deeper learning that promotes greater equity on a larger scale. In examining how some networks have re-created and sustained deeper learning models in dozens and sometimes hundreds of schools, this study found that they have done so by attending to multiple dimensions of change, ranging from structures to redesign schools and sustain deeper learning environments to partnerships with local stakeholders, robust systems of professional development, and systems for continuous improvement. The processes and systems have coalesced to support the sustainability and growth of these deeper learning models over time, helping to push against the obstacles that have often impeded fundamental change.

There is significant work to do to extend these kinds of practices beyond educational niches to entire districts and states. We hope these findings demonstrate some of the strategies that may eventually give young people universal access to the kind of learning they need to succeed in the complex, fast-changing world they live in and will soon lead.

Introduction

Deeper Learning in Action

The Everyday Mechanics classroom is abuzz on this Friday morning as students are hard at work on their projects: Some are sitting in the purple classroom chairs, working with two or three other students or working alone, and others are up at the whiteboard working together to draw their project blueprints. This is the 7th week their groups have been working to design homemade devices to help individuals with physical disabilities, drawing on the pre-calculus and physics content they have been learning in this interdisciplinary course. Students have now met and interviewed family members and others in their community who will be using their finished projects, so the pressure is on to create something that works.

Mr. Burgess and Mr. Schuette, the co-teachers of this course at Carolina High School and Academy in Greenville, SC, float around the room talking to students about their project plans, challenging them with questions, and taking moments to connect with each other about how to meet the needs of a wide range of learners. The agenda, in New Tech Network's learning management system, Echo, is projected on the classroom's SmartBoard and remains there for the entirety of the class period to remind students of the plan for the day, next steps, what is due, and their project's driving question (what students seek to answer over the course of their project).

A few weeks back, students walked into their classroom to find a letter addressed to the "Innovative Thinkers of Everyday Mechanics" on their desks, known as an entry document, designed to get students interested and curious about the project to come. Mr. Burgess, a first-year teacher, takes credit for naming the project "Work Work Work Work Work—Rihanna." A clever pop culture reference that received amused eye rolls from students, as it also names a physics concept they will be exploring in their project. The project's driving question is "How can homemade devices be used to help individuals with physical disabilities?" Mr. Burgess' sister, who recently became paralyzed and was his inspiration for the project, also joined the class to help introduce the project and share her experience.

In the weeks since the introduction to the project, students have completed physics and pre-calculus exercises, listened to guest speakers, participated in workshops designed by the teachers, and carried out multiple informal and formal presentations to their class on their project plans and research.

Today, students are listing and gathering the materials they will need to build their homemade devices and are beginning to construct their machines or rework their blueprints as needed based on their growing knowledge of physics. Materials are scattered throughout the classroom. Each group has a large piece of plywood leaning against their desks or tucked away along the shelves, a project supply provided through a community donation. A student getting ready to start construction asks Mr. Schuette some logistical questions about using the materials at hand, including how to drill something into the plywood since they cannot bring power tools to school. He explains that the class will have access to the woodshop if needed.

As the class continues working, one team of three girls, with their cell phones in hand and laptops in front of them, calls Mr. Burgess over to ask a question. The team wants to design a device to help their teammate's aunt, a burn victim who is unable to use her hands. The team developed

questions to ask the girl's aunt to assess her needs as an individual with a disability, after various, practical interview workshops in class, designed by the teachers. The team landed on wanting to develop a device to help the girl's aunt open soda cans. When Mr. Burgess comes over to help the group with their question, he challenges them with a question in return: "If she can't open the soda can, how can she put that thing under that?" as he points to their blueprint. "That's something you need to figure out. I have an idea, but I'm not telling you," he says, encouraging them to think critically about their plan. A few minutes later he stops by again to discuss a specific physics concept they have a question about.

As Mr. Burgess and Mr. Schuette describe later in an interview, they work together as a team to develop projects like this one and support each other in the classroom. As a first-year teacher, Mr. Burgess explained that he had no formal training in project-based learning and was open to, but unfamiliar with, New Tech Network and its model. Mr. Schuette, a teacher with over 9 years of experience, 3 years of which have been in project-based learning at this school, was able to support Mr. Burgess and orient him to the many processes as they began working to collaboratively plan projects. As Mr. Burgess explains, "In terms of working together, we got lucky that his strengths reflect my weaknesses."

They think their differences allow them to think more creatively about curriculum issues and give students more opportunities to build relationships with one or the other of them. Their partnership also allows them to problem-solve the many issues that arise in a course like this serving a heterogeneous group of students, such as how to group students for projects in a way that challenges them at their level and fosters collaboration and how to integrate learning about mathematics and physics content with project-based learning.

This kind of well-supported collaborative project work, which is applied to real-world problem-solving, is an example of what research from the sciences of learning and development suggests is important for deeper learning that can transfer to new contexts.¹ While this kind of practice is frequently urged by researchers and reformers, it tends to exist in small educational niches and has, historically, been difficult to spread and sustain successfully.

This study takes up the question of how deeper learning practices can be developed and spread by studying three networks of schools—Big Picture Learning, the Internationals Network for Public Schools, and New Tech Network—which have managed to spread powerful school models featuring deeper learning to dozens, and in some cases hundreds, of schools without diluting their practices. Furthermore, they have supported practitioners in enacting their sophisticated school models in ways that bring these experiences to students furthest from opportunity, mitigating inequities that generate disparities in access, school quality, and achievement. Notably, these organizations have also managed these feats by working, for the most part, with public school districts rather than opting out of the traditional system.

In the next sections of this report, we describe what equitable approaches to deeper learning require in terms of pedagogy and school design. We discuss the challenges of taking deeper learning to scale and the literature on system reform that discusses this problem. We then provide an overview of our research study, which investigates the systems and processes that have supported Big Picture Learning, the Internationals Network for Public Schools, and New Tech Network in spreading and sustaining their complex school models, and describe how the networks undertake this work. We

examine how the networks design the schools they work with, as well as their efforts to support schools in taking on these models; how they approach implementation, including professional learning; and how they set the stage for continuous improvement. Finally, we give examples of the implications of these findings for school and district reform.

What Equitable Deeper Learning Requires

Recent research from neuroscience and from the developmental and learning sciences indicates that, at a foundational level, optimal brain development and learning are catalyzed by affirming, responsive relationships that support attachment, psychological safety, and openness to experience.² Positive relationships with adults and peers encourage students to engage their curiosities and take learning risks while mitigating the effects of adversity that many students face.

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With this foundation, teachers can enact personalized instructional strategies that take into account students' experiences, strengths, and needs. These are most productive when they engage students in meaningful tasks that are intrinsically motivating, use inquiry as a key learning strategy, and provide ample opportunities for collaboration and feedback to foster growth in knowledge and skills at a student's own pace. In this process, students become active generators of knowledge as they engage in tasks that are at the appropriate level of challenge and tap into their interests and curiosities.³ This enables students to learn deeply in ways that allow them to apply what they have learned to new contexts, to think critically and solve problems, and to communicate their knowledge effectively to others so that it can inform collaborative work.

Deep learning also requires the explicit development of social-emotional skills alongside academic inquiry. Positive emotions, such as trust, interest, and excitement, open the human mind to learning, and challenging collaborative projects develop pro-social behaviors, from interpersonal skills to development of executive functioning needed for planning and organization to perseverance and resilience, as obstacles are encountered and overcome.⁴

Importantly, research also suggests that these practices are most effective when they are not just confined to individual classrooms. Rather, learning is most powerful when whole schools are designed to ensure that these conditions are achieved and sustained throughout the entire school so that positive relationships and supports are reliably available and so that skills, habits, and mindsets are reinforced.⁵

Further, enacting this kind of practice in ways that are successful for diverse learners, resulting in equitable outcomes, requires a positive school environment that supports students' development across all the pathways—physical, cognitive, social, and emotional—while it reduces stress and anxiety that create biological impediments to learning. A caring, culturally responsive learning community is essential—one where all students are well-known and valued and are free from social identity or stereotype threats that exacerbate stress and undermine performance. This

requires equitable access to curriculum and the removal of strategies, such as tracking, that signal deficit views of some students' capacities. Building the relationships needed to ensure effective, personalized instruction requires structures that allow for continuity in relationships—such as looping with teachers for more than one year, advisory systems, small schools or learning communities, and teaching teams. These can enable individualized supports, outreach to families, and a sense of belonging crucial to student success.⁶

While recent research has brought new evidence to bear that reinforces this multifaceted theory of learning, this approach is not new. In fact, U.S. educators who were keen observers of children and their learning have long sought to implement similar learning strategies in classrooms and schools. From John Dewey's progressive schools at the turn of the 20th century, to the schools launched and studied by the Progressive Education Association in the 1930s, to the alternative schools of the 1960s and 1970s and Theodore Sizer's Coalition of Essential Schools in the 1980s and 1990s, educators have sought to transform schools and systems to allow more student-centered and inquiry-driven approaches to flourish. Many of these efforts have sought to improve learning for the country's most vulnerable youth.

The Challenges of Sustaining and Spreading Deeper Learning Practices

Sustaining and re-creating these models have remained a challenge, however. Classrooms and schools characterized by student-centered learning practices typically deviate from the norms of transmission teaching, causing them to confront institutional obstacles as they seek to implement and spread their high-quality models with fidelity.

Obstacles include those related to the technical elements of teaching and learning—the instructional shifts that can allow students to consistently engage in meaningful applied learning experiences aimed at higher-order thinking and complex problem-solving in heterogeneous classrooms while they are supported to close gaps in their understanding and skills. There are also social and emotional elements associated with the need to teach and learn collaboratively, in a psychologically safe environment, with strong supports for executive function, self-regulation, motivation, and perseverance.

This kind of classroom demands highly sophisticated teaching skills, which are not always widely cultivated in the teaching force. Historian Lawrence Cremin (1961) argued that earlier attempts at progressive education reform failed because the approach demanded “infinitely skilled teachers” who could not be recruited and retained in sufficient numbers to allow such practices to spread beyond the innovators who initially planted them.⁷

Other impediments have included incompatible curriculum and testing policies, as well as policy churn, teacher and administrator turnover, inequitable school funding, and periodic disinvestment in public education, which have exacerbated challenges to enacting lasting change.⁸ In addition, leaders seeking to enact, sustain, and spread these meaningful learning approaches have confronted entrenched norms that govern school structures, developed to promote standardization in the era of the assembly line,⁹ as well as social interactions in schools grounded in institutionalized racism and beliefs about student ability.¹⁰ These elements of change, which require ongoing efforts to shift mindsets and mitigate bias, have often stunted the implementation of promising teaching and learning practices.¹¹

This Study

Given the elusive nature of change and sustainability, are there schools or systems that have successfully instantiated, sustained, and spread deeper learning practices across multiple sites? Have any been able to do so in ways that advance equity or that do not fall prey to the tendency to reserve these empowering practices for the most advantaged students but rather to produce greater success for traditionally marginalized students? If so, how have they overcome institutional challenges to instantiate these complex practices in different settings?

This study set out to answer these questions. It turns out that—in addition to longstanding international models, such as Montessori education or Waldorf schools—there are a number of networks of schools in the United States that have accomplished this, many of them launched during the 1980s and 1990s. Among these are the three school networks we chose to study, all of which engage in inquiry-based learning that has resulted in positive outcomes for students, most of whom are students of color from low-income families:

- Big Picture Learning, an experiential and interest-based learning approach grounded in personalized, transdisciplinary courses of study and workplace learning that typically takes place in internships;
- The Internationals Network for Public Schools, which serves newcomers with an “activity-based” pedagogical model that features collaborative, inquiry-based learning for English learners who have had widely variable levels of education before coming to the United States; and
- New Tech Network, which offers a whole school model grounded in interdisciplinary project-based learning that is technology supported, including resources for both teachers and students to facilitate collaborative learning.

While each network has a distinct approach, they all ground their instructional approach in *deeper learning*—teaching and learning practices that enable students to learn core academic content and apply their knowledge to relevant problems. Deeper learning approaches, including project-based learning, work-based learning, and performance assessments, allow students to explore their interests and learn academic content in personalized and inquiry-based ways.¹² They help students think critically and solve complex problems using mathematical, scientific, and creative reasoning.

To this end, teachers engage students in learning experiences that require collaboration, effective communication, and self-directed inquiry, enabling students to “learn how to learn” and develop mindsets that increase perseverance and productive learning behaviors.¹³ These practices enable students to develop versatile skills and mindsets that are powerful and relevant to their interests and life trajectories and, in doing so, to generate improved outcomes for student learning and the development of interpersonal and intrapersonal skills.¹⁴

In this study, we seek to demystify how these organizations have instantiated and scaled their models across the country, thus increasing access to deeper learning for a much wider range of students, including marginalized economic, racial, and linguistic groups. By scale, we do not merely mean their numeric spread, though by this measure, each network has achieved expansive reach

and institutional presence. Rather, we seek to understand how the networks have supported the successful instantiation of new school designs, along with sophisticated deeper learning pedagogies and practices, which are implemented with integrity in a variety of settings.

To this end, we consider how the networks design schools so that their models can flourish, build relationships with districts and schools to develop a shared commitment to equity and deeper learning, and create systems of professional learning to transmit practices. We investigate the systems and structures that have enabled the networks and their partners to address the technical, institutional, and normative challenges of fundamentally transforming teaching and learning. Investigating scale in this way allows us to see how these organizations have moved beyond a surface-level replication of their models to one that attends to the multiple dimensions of change that necessarily accompany the re-creation of their deeper learning models in different and unique contexts.¹⁵

The networks have done more than carve out remote islands of innovation within districts. They have created working partnerships grounded in a co-design and coaching model that recognizes that, in most cases, the daily operations of schools rest with the districts. A critical question, then, is how do the networks structure partnerships to achieve success within a wide range of locales and districts with disparate policies, resources, and funding?

The networks have done more than carve out remote islands of innovation within districts. They have created working partnerships grounded in a co-design and coaching model.

Through an analysis of qualitative data sources, including documents, interviews, and observations of classrooms and professional learning events (see Appendix A for full description of the study's methodology), we find that the networks share common systems that have helped to instantiate their deeper learning school models in new settings. These include:

- designing whole schools with structures to personalize learning and to support equitable outcomes, including supports that address students' academic and social-emotional needs;
- collaborating with school, district, and/or community partners to implement network models in ways that develop a shared commitment to deeper learning and equity;
- providing ongoing professional learning supports that enable teachers and leaders to develop and improve their practice;
- developing leaders who instantiate network practices in new and existing sites; and
- maintaining a learning orientation that allows the network and its affiliated schools to continually improve their designs to ensure quality and equity.

Through these approaches, the three networks are able to re-create their deeper learning models in context-sensitive ways, allowing them to grow and sustain their organizations in partnership with local communities.

Before turning to our findings, we provide an overview of the research on deeper learning and its implementation, including issues of scale, and present descriptions of the three networks and their models.

What We Know About Deeper Learning and Scale

Like earlier efforts to transform schools into more student-centered and inquiry-driven learning spaces, deeper learning aims to engage students in the practices that science and research identify as fostering meaningful learning. In turn, it has recently been promoted as part of a concerted effort to prepare all students to meet the demands of the 21st century and to close the opportunity gap between and among advantaged and disadvantaged groups.

With its growing prominence, researchers have documented the impact of this approach on student learning and its ability to be implemented in U.S. schools. Studies include those seeking to understand deeper learning's impact on student outcomes as well as those that investigate if it fosters higher-order thinking skills (e.g., problem-solving and critical thinking) and interpersonal and intrapersonal competencies (e.g., collaboration, effective communication, self-directed inquiry, motivation, and growth mindset). In addition to investigating the impact of deeper learning, researchers have conducted in-depth investigations of deeper learning models and practices, such as authentic assessments, project-based learning, and work-based learning, to understand if or how they are effectively implemented.

Deeper Learning Outcomes

Researchers have demonstrated that deeper learning generates improved student learning, particularly for students furthest from opportunity. For example, in a recent set of studies, the American Institute for Research (AIR) found that access to deeper learning pedagogies in network schools, including project-based learning, work-based learning, and performance assessments, improved the academic performance of all students, including those from historically marginalized groups. In comparing students who attended schools with moderate to strong implementation of deeper learning in California and New York City with their local counterparts serving similar students, researchers found that students with access to deeper learning achieved higher scores on average on the OECD PISA-Based Test for Schools in reading, mathematics, and science.¹⁶ A similar impact held true for performance on state-mandated tests in math and English language arts; researchers found that students in deeper learning environments outperformed their counterparts.¹⁷ Others have found that the academic effects of attending schools affiliated with deeper learning networks are positive for both high and low achievers, suggesting that deeper learning can benefit students across the developmental and learning spectrum.¹⁸

Researchers have also investigated the impact of deeper learning on graduation rates and postsecondary outcomes. For example, students in the AIR study who attended deeper learning network schools graduated at a higher rate (i.e., about 8% higher) when compared to similar students in non-network schools, making them more likely to graduate on time from high school.¹⁹ Students in these networks were more likely to enroll in an institution of higher education and to apply to college than their peers who attended comparison schools.²⁰ This pattern holds true for students from marginalized racial groups who attend deeper learning schools. Data suggests that they graduate from high school at higher rates, and students report having a stronger interest in enrolling in a 4-year institution as part of their postgraduation plans when compared to their counterparts.²¹

While the evidence of deeper learning's impact on test performance and postsecondary outcomes is compelling, these indicators do not fully capture student learning, nor do they reflect gains in many of the competencies at the core of deeper learning. To better understand how deeper learning approaches further students' cognitive and noncognitive skills, researchers have also sought to understand how these pedagogical practices develop students' interpersonal and intrapersonal skills. Data show that teachers and leaders in deeper learning network schools put more emphasis on the intentional development of these skills (e.g., collaboration, motivation to learn, content engagement, and making real-world connections) in their teaching.²² With the emphasis on these skills, students have predictably reported higher levels of many of these interpersonal and intrapersonal competencies on surveys when compared to their peers in non-network schools.²³ For example, students attending network schools reported greater collaboration skills, self-efficacy, and academic engagement.²⁴

Impact of Deeper Learning Practices

In addition to general assessments of deeper learning on student outcomes, researchers have highlighted the impact of specific deeper learning models or pedagogical practices.

Project-based learning

As a pedagogical approach, project-based learning develops students' knowledge and skills while they investigate meaningful problems or answer a complex question. Projects often center on real-world issues; incorporate interdisciplinary and standards-based tasks related to scientific inquiry, writing, and quantitative reasoning; and often require that students present their work publicly.²⁵

Some studies examine the impact of project-based learning on traditional student outcomes. For example, when examining the effect of project-based learning in science units within Detroit Public Schools, researchers found that this pedagogical approach led to increased test scores for historically underserved students.²⁶ Additional studies of project-based learning in Iowa, Massachusetts, and Maine have shown similar increased gains on state-sanctioned exams in a range of subject areas.²⁷

Other researchers have captured the impact of project-based learning on the additional competencies that deeper learning seeks to foster.²⁸ For instance, research has demonstrated that students have improved higher-order thinking skills from engaging in project-based learning, often developing more useful, real-world content knowledge²⁹ and long-term retention of knowledge and skill.³⁰ In addition, studies show that project-based learning increases student engagement and motivation to learn among high-achieving and low-achieving students, as well as those from historically underserved communities.³¹ Finally, evidence suggests that the peer collaboration fostered among students during projects generates particular benefits. Many researchers have documented how collaboration results in better solutions to problems and stronger academic outcomes.³² Through qualitative case studies, researchers have demonstrated that students who engaged in project-based learning understood concepts from multiple perspectives, developed conflict resolution skills, and honed social skills, including empathy, patience, and improved communication.³³

Work-based learning

Another frequently studied deeper learning approach is work-based learning. Work-based learning asks students to build their content knowledge and skills in real-world employment settings through authentic work experiences and collaborations with peers, teachers, and workplace mentors. Typically, schools provide students with interdisciplinary academic instruction while employers offer out-of-school internships or job placements that allow students to develop habits and skills, including problem-solving, collaboration, and critical thinking.³⁴

Work-based learning asks students to build their content knowledge and skills in real-world employment settings through authentic work experiences and collaborations with peers, teachers, and workplace mentors.

Researchers examining student outcomes as they relate to work-based learning and its various iterations (e.g., career and technical education, Linked Learning pathways) have found positive effects. For example, some studies examining career and technical education (CTE) programs have found that when compared to their non-CTE peers, students enrolled in CTE programs earned better grades, scored higher on achievement exams, were more likely to graduate and enroll in postsecondary settings, and were better prepared to persist in 2- or 4-year institutions of higher education.³⁵

More recently, researchers from SRI International found similarly positive effects for students participating in California's Linked Learning District Initiative.³⁶ Through their 7-year longitudinal study, researchers found that students in career pathways were 5.3 percentage points more likely to graduate high school, scored higher on the English language arts portion of the state's high school exit exam, and earned 8.9 more credits by the end of high school when compared to their peers.³⁷ This evidence is particularly notable given that a high proportion of students participating in Linked Learning begin at below-average achievement levels and/or come from marginalized racial or economic backgrounds.

The SRI study also shed light on the impact of work-based learning on students' interpersonal and intrapersonal skills. It found that students participating in the career pathways showed greater improvement in collaboration, communication, and informational literacy when compared to students on traditional high school tracks.³⁸ Others, too, have found that students participating in work-based learning improve on a host of noncognitive skills that support their learning and success. For instance, some researchers have found that work-based learning increases student motivation and persistence in schools by challenging them and taking them out of their comfort zones and into authentic settings.³⁹ Other studies have found that students reported higher levels of self-awareness, growth mindset, self-regulation, and confidence after participating in work-based learning experiences.⁴⁰

Authentic assessments

Authentic assessments are another deeper learning practice that researchers have investigated with respect to student outcomes. Authentic assessments, also known as performance assessments, refer to those that go beyond factual demonstrations of content knowledge on multiple choice or short-answer tests to include demonstrations of knowledge, skills, and mastery that reflect how they are used in the real world. The on-the-road driver's exam that supplements the multiple choice test given to would-be drivers is one example. Students are typically asked to apply their knowledge and skills in creating a paper, project, product, presentation, or demonstration.⁴¹ These may be assembled and communicated through student portfolios or the systematic collection of student work samples, records of observation, scored papers or products, and other artifacts collected over time to evaluate growth and achievement.

Studies in states ranging from California and Washington to Kentucky, Maine, Maryland, and Vermont have found that regular participation in authentic assessments improves the quality of instruction⁴² and improves achievement on both traditional standardized tests and more complex performance measures that assess deeper learning competencies.⁴³ Research also suggests that students who are engaged in completing performance tasks and portfolios that require reflecting on and revising their work ultimately perform better on higher-order thinking measures (e.g., synthesis, analysis, critical thinking, communication) and demonstrate stronger growth mindsets.⁴⁴

There is also evidence that engagement in this kind of work better prepares students for college. For example, a study of schools in New York's Performance Standards Consortium, a coalition of 38 New York public schools implementing performance assessments, reported higher graduation rates and college persistence rates for participating students of color, English learners, and students from low-income families when compared to students attending non-consortium schools.⁴⁵ Similarly, research on Envision Schools, a network of charter schools in the San Francisco Bay Area that uses a portfolio defense model, has found that, across years, more than 80% of its students attend 4-year colleges and universities, and they demonstrate college-persistence rates far above national averages.⁴⁶ Complementing these findings is research that suggests that authentic assessments are more valid predictors of academic and career success and persistence than standardized assessments that students must typically complete to access institutions of higher education.⁴⁷

One reason that performance assessments embedded in classroom instruction may help support stronger learning for students is that they ensure that students are undertaking intellectually challenging tasks. If teachers use these kinds of assignments consistently, with feedback and opportunities to revise to meet high standards, the level of rigor in the classroom increases. In addition, these assessments provide information to teachers regarding how students think and try to solve problems. This feedback allows teachers to diagnose students' strengths as well as gaps in understanding. This enables teachers to see more easily what kind of help students need so they can tailor instruction accordingly.⁴⁸

Creating Deeper Learning Environments

Given the complexity of deeper learning models and practices, a growing body of research has aimed to capture the structures and strategies teachers and school leaders use to create deeper learning environments. In addition to describing how broader pedagogical approaches (e.g., project-based learning, internship opportunities, performance assessments) are adopted and implemented,⁴⁹ researchers have described how educators foster deeper learning in daily practice.

For example, to teach interpersonal skills, such as communication and collaboration, teachers frequently provide opportunities for student group work and public sharing of knowledge and progress.⁵⁰ To support the development of intrapersonal skills, such as self-motivation and persistence, deeper learning educators explicitly discuss these skills with students and provide them with opportunities to develop agency through participation in school or classroom decision-making. Teachers and leaders at deeper learning schools also cite the use of project-based and real-world learning as ways to promote resiliency within and among students.

In studies of project-based learning, researchers have described essential components of successful project-based models, including the use of strategic scaffolds to support learning, structures for group work to ensure equal levels of participation, and student choice that develops students' ownership over the content and work.⁵¹ Studies have also highlighted the challenges educators must overcome to implement project-based learning effectively. These barriers include creating a culture of collaboration in classrooms, adjusting to the time-consuming nature of project completion, and incorporating technology in substantive ways. Shifting teacher roles—or the adjustment to a more facilitative approach to teaching rather than a directive one—is also noted as a requirement for implementing this deeper learning model.⁵²

Studies have also identified a range of school structures that enable deeper learning to thrive. A 2014 study of 19 deeper learning high schools described three such structures: advisories, alternative scheduling, and personalized school cultures.⁵³ Advisories, which can be defined as regular meetings between an advisor and a student or a group of students to provide academic and social support, were the structures most frequently mentioned by school personnel. Teachers and leaders suggested that advisories were critical to fostering personalization and strong relationships, which provide the foundation for student learning.

Alternative or flexible scheduling, which includes the use of block schedules, zero-periods, off-site learning hours, and extended days, was also frequently cited as a structure that allows students to spend more time delving into projects and learning activities. Personalized school cultures, which were often described as “families” by study participants, were seen as fundamental to engaging and supporting students in their academic and social-emotional needs.⁵⁴

Professional Development for Deeper Learning

Access to deeper learning is contingent on teachers and leaders' abilities to implement these complex pedagogical models to support student learning. Yet few teachers have engaged in deeper learning in their own educational experiences, nor have they received professional development in their preparation programs to develop fluency with these practices.⁵⁵ Thus, to ensure that deeper learning takes hold in schools, district and school leaders have to explicitly develop teachers through professional learning opportunities.

While important for the growth and quality of deeper learning environments, the research of professional development for deeper learning is fairly limited. Instead, research has shed light on how practitioner mindsets and practices may inhibit or support the onset of deeper learning, ultimately suggesting areas for professional development. For example, researchers at AIR conducted a survey-based study investigating how educators' perceptions of sound teaching, school culture, and instructional support affected their ability to adopt deeper learning practices.⁵⁶ They found that beliefs in teacher-centered pedagogy, a perceived lack of collegiality, and insufficient instructional leadership were negatively related to student opportunities for deeper learning.

Conversely, in another survey-based study that examined 12 deeper learning network schools, researchers found that strongly held teacher beliefs in student-centered approaches and a positive sense of self-efficacy were strongly correlated with the use of deeper learning pedagogies and strong student outcomes.⁵⁷ These mindsets have also been found to have positive effects on the implementation of strong project-based learning environments.⁵⁸

An international survey noted that both teachers' sense of self-efficacy and their use of deeper learning-type practices were associated with the degree to which teachers experienced opportunities for collaboration with their peers.⁵⁹ A wide-ranging literature review found that other factors, including teacher expectations, the presence of professional learning communities, and leadership stability, have been associated with deeper learning and its outcomes in some studies, though not in others.⁶⁰

Through this research, practitioners seeking to implement deeper learning models can consider some of the factors that may support deeper learning. Professional learning opportunities that expose educators to the power and possibilities of these approaches and provide teachers and leaders with ways to hone new practices may yield significant benefits. Yet more studies are needed to further understand the professional developmental models that support the onset and sustainability of deeper learning practices.

Taking Deeper Learning to Scale

The growing body of research on deeper learning demonstrates the promise of these models and practices and provides insights into how educators can use structures and practices to foster deeper learning in their classrooms. Yet how these learning approaches are spread and replicated remains less understood.

One of the research challenges in understanding how deeper learning networks re-create their practices stems from competing definitions of what replication or "going to scale" means. Traditionally, "scaling up" is defined as the numeric spread of an initiative or policy, or the net size or number of schools reached by a reform.⁶¹ However, many reforms are implemented superficially and resemble little of the original intention as they spread to schools further from the inception of their ideas and practices. Researchers have documented many of the ongoing challenges to large-scale reform within districts that can water down efforts to spread new practices, ranging from funding to lack of adequate leadership and professional development.⁶²

Given the complex dynamics reformers face when they expand and implement practices across schools and districts, some scholars argue that scale should also be assessed based on the *depth* and *sustainability* of reform implementation; the *spread* of beliefs, norms, and principles to classrooms and schools; and the degree to which practitioners develop *ownership* of the policy and are supported in developing the *expertise* that will allow it to flourish.⁶³

Rather than seeing the idea of scaling as the implementation of a top-down reform in which replication is a technical problem, this scholarship views the problem of scaling as an “adaptive challenge of spreading human learning and collective meaning making, in actual practice and organizational systems.”⁶⁴ This line of research suggests that to spread complex pedagogical models, practitioners will have to shift their focus toward building collaborative capacity, creating systems that allow educators to learn in ways that mirror what is expected of students, and developing leaders who can support the development of these processes and systems⁶⁵

Some research is finding that school networks hold promise as a means to scale up effective practices. School networks are educational organizations that replicate and spread their models under their organizations’ common philosophies, core values, and pedagogical approaches. They can implement their models in partnership with school districts or operate schools autonomously as charter schools within a district’s geographic region.

School networks are educational organizations that replicate and spread their models under their organizations’ common philosophies, core values, and pedagogical approaches.

As intermediary organizations, networks can alleviate some operational challenges that teachers and leaders face in schools and support their staff through targeted professional development, collaborative problem-solving, and useful partnerships with districts and other organizations.⁶⁶

While school networks can take on various forms, the scaling up of charter management organizations has received considerable attention as substantial government and philanthropic funding has been devoted to their growth.⁶⁷ Some studies describe factors and structures, such as network office capacity and adequate funding, that enable networks to implement and sustain their charter schools in different regions.⁶⁸ However, the curricular and teaching practices documented—such as additional school time and specific behavior management policies—have not been focused on the kinds of pedagogies associated with deeper learning.⁶⁹

Thus, research on how complex deeper learning models proliferate remains limited. This report focuses on deeper learning networks to identify the structures and systems that three exemplar organizations use to systematically re-create their models. In doing so, we hope to deepen understanding of how they have spread their complex pedagogical approaches in unique and disparate contexts to engage students who are furthest from opportunity in rich learning experiences.

The Networks

Big Picture Learning, Internationals, and New Tech Network represent exemplar cases⁷⁰ that have instantiated their approaches in numerous cities, states, and countries and, in that process, have advanced educational equity. Each network re-creates whole school models grounded in deeper learning. Their school models incorporate staples of deeper learning instruction, such as performance assessments and project-based learning, but they do so in unique ways that support their distinct visions and student populations. In the following sections, we provide an overview of each network's history, deeper learning model, and impact on student learning.

Big Picture Learning

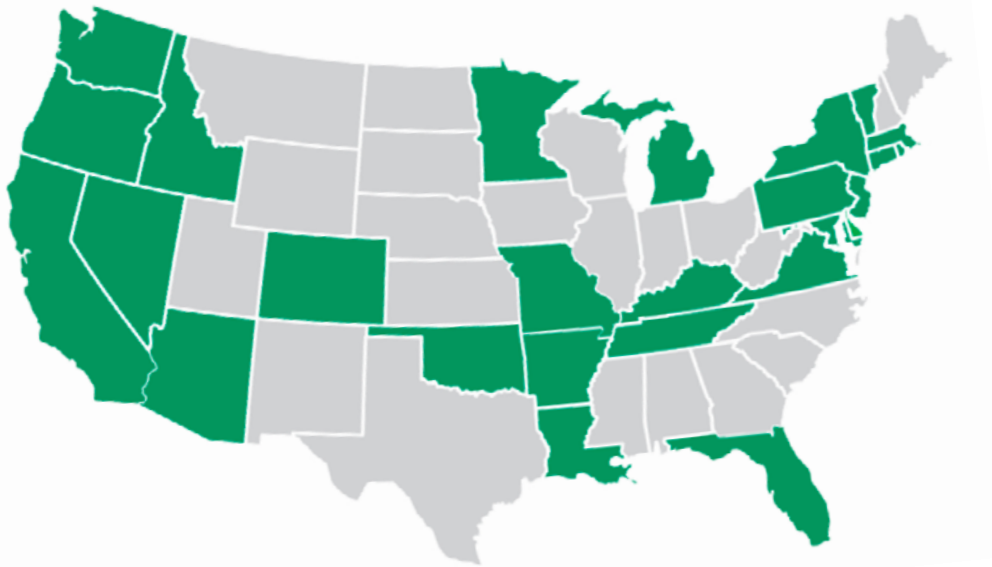
Big Picture Learning puts each student directly at the center of his or her own learning by engaging students in experiences that allow them to develop knowledge through interest-based and workplace-situated learning opportunities. Network schools enable their students to delve deeply into their interests through career exploration and personalized, transdisciplinary instruction that blurs conventional disciplinary boundaries to support authentic learning. In this way, network-affiliated schools build communities of learners where academic content is inextricably linked to students pursuing their own passions.

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Big Picture Learning was founded by Dennis Littky and Elliot Washor, two thought leaders who “merged their thirty years of experience as teachers and leaders and their distinct national reputations to launch this new innovation in education.”⁷¹ Littky and Washor developed an educational philosophy inspired by the work of John Dewey and many others. The philosophy emphasizes the importance of learning through experience⁷² and centering student interests on occupation-based learning.

With this perspective, the co-founders designed and established the first Big Picture Learning school, the Metropolitan Regional Career and Technical Center (the MET), with 30 students in Rhode Island in 1996 to bring this vision to life. As of 2018, the network includes 62 schools in the United States, and it supports more than 100 schools internationally, including schools in Australia, Belize, Canada, Italy, India, Israel, the Netherlands, and New Zealand. (See Figure 1 for a map of the Big Picture Learning Network in the United States.)

Figure 1
Big Picture Learning Network in the United States



Data source: Big Picture Learning. (n.d.). About Us—Our Schools. https://www.bigpicture.org/apps/pages/index.jsp?uREC_ID=422935&type=d&pREC_ID=923039 (accessed 07/01/17).

Expanding equity

As Big Picture Learning has grown its network, it has spread its student-centered, deeper learning vision to predominantly historically disenfranchised groups who are often furthest from opportunity. More than 65% of Big Picture Learning’s student population is Black, Latino/a, or Indigenous, and more than 60% of students in Big Picture Learning schools qualify for free and reduced-priced lunch. Furthermore, approximately 20% of students receive special education services. With a network made up of 90% urban schools, 5% rural, and 5% suburban, Big Picture Learning has spread its vision of student-centered learning to historically underserved communities.

In implementing its deeper learning approach with this student population, Big Picture Learning seeks to advance educational equity by immersing its students—most of whom come from marginalized socioeconomic backgrounds—in student-driven learning environments. From the network’s inception, its co-founders fundamentally saw their pedagogical vision as inextricably tied to equity. Littky explained that equity was fostered in their schools by emphasizing relationships, relevance, and rigor in their design. Furthermore, Washor explained that these elements, which are often fostered through interest-based learning, had often been instructional staples of affluent schools and, if implemented, were typically enacted in a way that maximized student voice and agency. In centering student interests and providing authentic learning experiences, Big Picture Learning has successfully provided students furthest from opportunity with experiences that enrich their academic, personal, and civic development.

Interest-based learning at Big Picture Learning schools

Big Picture Learning identifies 10 features or “distinguishers” that are central to its approach and advance the network’s interest-based, deeper learning vision. (See Figure 2.) The network explains that these distinguishers “are interrelated and inform one another—none work in isolation.”⁷⁵

Figure 2

Big Picture Learning's 10 Distinguishers

ONE STUDENT AT A TIME—The entire learning experience is personalized to each student's interests, talents, and needs. Personalization expands beyond mere academic work and involves looking at each student holistically.

ADVISORY STRUCTURE—Advisory is the core organizational and relational structure of a Big Picture Learning school, its heart and soul, often described as a “second family” by students. Students stay with an advisor and a group of fellow classmates for four years, building close personal relationships that last a lifetime.

LEARNING THROUGH INTERESTS AND INTERNSHIPS (LTIs)—Real world learning is best accomplished in the real world. Big Picture students intern—often twice a week for an entire school day—with experts in their field of interest, completing authentic projects and gaining experience and exposure to how their interests intersect with the real world.

PARENT AND FAMILY ENGAGEMENT—Parents are welcome and valued members of the school community and play a proactive role in their children's learning, collaborating in the planning and assessment of student work. They use their assets to support the work of the school, and often play an integral role in building relationships with potential LTI mentors.

SCHOOL CULTURE—In Big Picture schools, there is palpable trust, respect, and equality between and among students and adults. Students take leadership roles in the school, and teamwork defines the adult culture. Student voice is valued in the school decision making process and visitors are struck by the ease with which students interact with adults.

AUTHENTIC ASSESSMENT—Students are assessed not by tests, but by public displays of learning that track growth and progress in the student's area of interest. Assessment criteria are individualized to the student and the real world standards of a project. Students present multiple exhibitions each year and discuss their learning growth with staff, parents, peers, and mentors.

SCHOOL ORGANIZATION—Schools are organized around a culture of collaboration and communication. They are not bound by the structures of buildings, schedules, bells, or calendars. There is an interdependence between school and community.

LEADERSHIP—Leadership is shared and spread between a strong, visionary principal; a dedicated, responsible team of advisors and other staff; and students. The community functions as a democracy. A pervasive sense of shared ownership drives a positive culture dedicated to ongoing improvement.

POST-SECONDARY PLANNING—Students develop plans that contribute to their future success—be it through college, trades, schools, travel, the military, or the workforce.

PROFESSIONAL DEVELOPMENT—Regular advisor PD is conducted at each school by principals, other school staff, and BPL staff and coaches. A Big Picture School is a community of lifelong learners who embrace continuous improvement.

Source: Big Picture Learning. (n.d.). 10 Distinguishers—Big Picture Learning. https://www.bigpicture.org/apps/pages/index.jsp?uREC_ID=389353&type=d&pREC_ID=902235 (accessed 03/01/19).

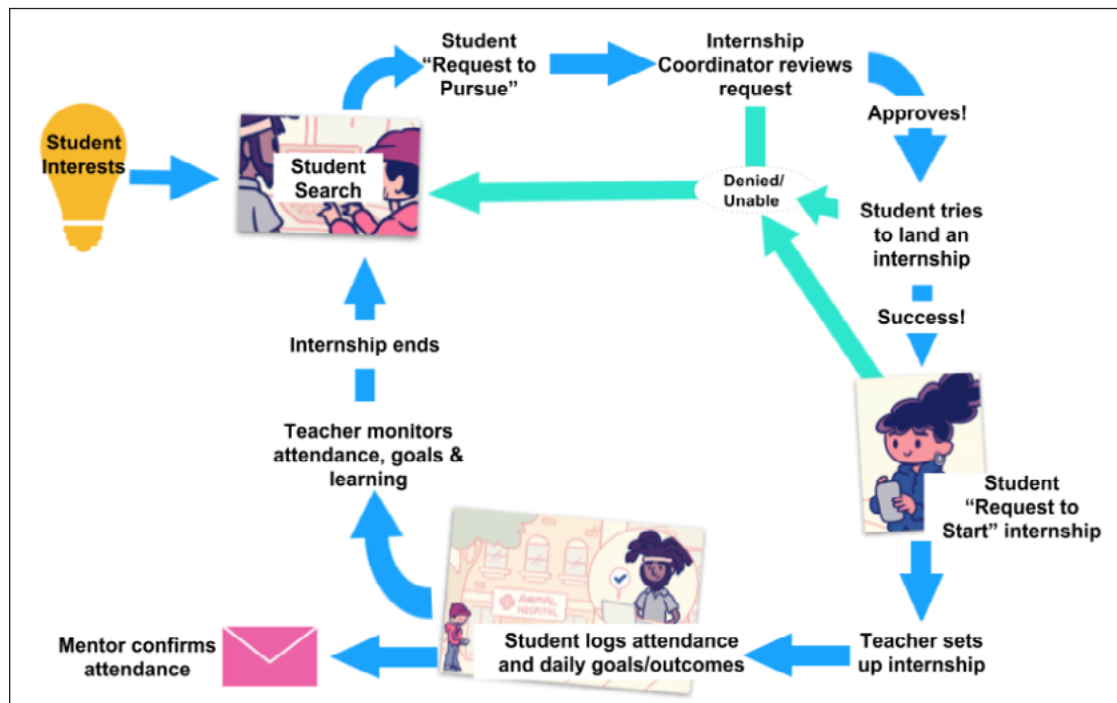
While all distinguishers play an important role in enabling Big Picture Learning’s educational philosophy and approach to be enacted, the network has identified high-leverage distinguishers, including advisory structure, Learning Through Interests and Internships, “One Student at a Time” personalization via individualized learning plans, and authentic assessments, as the fundamental pillars of the network’s approach.⁷⁴ Through these distinguishing features, Big Picture Learning cultivates learning environments that are centered on students and their varied needs at every turn.

Learning Through Interests and Internships (LTIs)

Big Picture Learning delivers its vision of deeper learning through interest-based internships. This workplace learning approach provides Big Picture Learning students with internship opportunities to explore their personal curiosities and gain specialized knowledge through real-world learning experiences. At most schools, students intern in organizations within the community 2 full days per week. Students may change internships throughout the year and usually hold several internships throughout their 4 years.

To secure an internship, students work closely with their teachers, whom the network calls “advisors,” and school-based coordinators to identify their interests and related career opportunities. Students then research local businesses and organizations, conduct informational interviews, and participate in shadow days at sites of interest. If the student decides to pursue the internship, the teacher and student will meet with a mentor, the primary contact for the student at the internship, to discuss expectations and potential areas of work. (See Figure 3 for real-world learning cycle depiction.)

**Figure 3
Big Picture Learning’s Real-World Learning Cycle**



Source: Big Picture Learning. (n.d.). ImBlaze. <https://www.imblaze.org> (accessed 05/19/19).

After students have spent time at their internships, mentors, advisors, and students collaboratively develop a focus for students' work and projects that allows students to explore their interests while building their academic and industry-specific knowledge and transferrable skill sets. Internship-based projects are intended to advance learning by giving students concrete tasks and exposing them to work and professionals in their respective industries. Student projects at internship sites are also intended to provide tangible benefits to the internship sites by addressing organizational needs. To illustrate, a Big Picture Learning student in the Pacific Northwest worked with a preschool teacher at the school's in-house daycare center to learn about early childhood education while addressing the capacity needs of the center. Similarly, a student attending a network school in the Northeast, interested in art and graphic design, launched an online store to meet the growing demand of a local trophy shop.

Overall, these workplace learning experiences exemplify Big Picture Learning's student-centered approach. Internships allow students to pursue their passions, build meaningful relationships with adults, think critically about postsecondary plans, and engage in authentic and relevant learning related to their interests.

Furthering interest-based learning in schools

When Big Picture Learning students are not at their internships, they are in their schools engaging in a mix of shared and individualized learning experiences. At times, Big Picture Learning students take common courses in subject areas such as mathematics that correspond to their academic levels or electives, often co-led by teachers and students, that align with their interests. Yet Big Picture Learning students spend much of their time in school working independently or with their advisors to design and implement personal projects that further enable them to explore their interests and advance their learning.

For example, a signature Big Picture Learning student project is an *autobiography* that students begin during their first year as a means of self-exploration and to delve deeply into their personal and family histories. This self-exploration helps students to identify academic, career, and personal goals, a necessary component to implementing the network's student-centered learning approach. Autobiographies build into a comprehensive *autoethnography*, which students complete during their third and/or fourth year. The project asks students to research a subgroup or community to which they belong to develop a rich understanding of the social, political, and economic factors and histories affecting the group's opportunities and constraints. To illustrate, one Big Picture Learning student investigated the lives of children of active military members to contextualize her own experience as a child whose father had frequently been deployed overseas.

Finally, Big Picture Learning students conduct a *senior thesis project*, which asks them to design, lead, and implement a project that addresses a problem within their community, to culminate their high school careers. The project requires students to demonstrate Big Picture Learning's five learning goals, which include empirical, quantitative, and social reasoning, as well as their growth in personal qualities and communication. (See Figure 4 for a detailed description of Big Picture Learning's learning goals.) For example, a Big Picture Learning student identified the need for access to women's health clinics in her neighborhood and created a website called "Safe Place Project" that catalogues locations of women's health clinics nationwide. The project was featured in local and national press publications.

Figure 4
Big Picture Learning's Five Learning Goals

EMPIRICAL REASONING
How do I prove it?

- Think like a scientist
- Make hypotheses
- Design research projects
- Collect data
- Analyze information
- Discuss error

QUANTITATIVE REASONING
How do I measure, compare or represent it?

- Think mathematically!
- Use numbers to evaluate problems
- Estimate
- Represent data with formulas, tables and graphs
- Create and analyze budgets
- Interpret formulas, tables and graphs
- Measure shapes and create scale drawings and models
- Analyze data, find trends, make predictions

COMMUNICATION
How do I take in and express ideas?

- Communicate ideas!
- Read
- Write
- Speak
- Listen
- Use Technology
- Create Art: Visual art, Music, Theater, Dance

SOCIAL REASONING
What are other people's perspectives on this?

- Think historically and culturally!
- Look at diverse viewpoints
- Research the history of your topic
- Analyze social systems
- Discuss ethics
- Take action in the community

PERSONAL QUALITIES
What do I bring to this process?

- Build skills for success!
- Demonstrate respect
- Empathize
- Strengthen your health
- Show responsibility
- Organize your work
- Manage your time
- Increase your self-awareness
- Work cooperatively
- Enhance your community

BIG PICTURE LEARNING

Source: Big Picture Learning. (n.d.). The learning goals. <http://www.bigpicture.org/apps/download/ZpD0sXp9Dnd7Grk0Bjpoavb7oEsX7yRVka4MDarQ6lLqoBly.jpg/LearningGoals.jpg> (accessed 05/19/19).

Each of these learning experiences allows students to explore their interests through transdisciplinary inquiry. In designing and implementing each project, students are expected to investigate the empirical, quantitative, social, and literary dimensions of their topics of interest. They do so in consultation with their advisors who pose open-ended questions that allow them to surface their interests and connect them with potential resources that can inform their learning.

Authentic assessments and exhibitions

Big Picture Learning uses authentic assessments to assess student growth. Rather than only emphasizing the evaluation of student achievement via test scores, Big Picture Learning believes that student learning is best captured in formative and summative demonstrations of learning. For example, student progress is informally observed through teacher-student conferences and during visits to internship sites. On the more formal end of the spectrum are student exhibitions. Exhibitions are performance assessments that take place multiple times a year wherein students give a presentation of their current work and provide evidence that demonstrates progress toward mastering academic and personal goals. Students present this work to an audience that consists of students, families, teachers, peers, and mentors. Each member of the audience provides feedback and assesses the student using a rubric that evaluates the student's personal qualities, social reasoning, quantitative reasoning, communication, and empirical reasoning—Big Picture Learning's five learning goals. (See Figure 3.)

Central to Big Picture Learning's implementation of authentic assessments are student learning plans. Each student at Big Picture Learning generates an individualized learning plan, which includes the student's vision, goals, and projects. Learning plans are living documents that students revise after exhibitions and frequently iterate upon as student curiosities develop and evolve.

Advisories

Big Picture Learning's main structure for implementing its deeper learning model is the advisory system. Advisories are composed of approximately 12–25 students who remain with the same advisor and cohort of students for the duration of their time at the school. Because of this structure, advisors are charged with facilitating students' educational progress, independent projects, and internship experiences.

At Big Picture Learning schools, a typical day in advisory begins with a circle to discuss current issues and students' personal and family lives. By giving students the space and agency to discuss public and private events, circles offer an example of Big Picture Learning's use of the school day to build relationships while simultaneously addressing students' social and emotional needs.

Advisories are also classrooms where students spend much of their day engaging in individualized, independent work study. Advisors typically confer with students individually to pose questions that surface students' interests, to help them develop and complete robust projects, and to ensure that students are amassing content knowledge that supports credit accrual. To this end, advisors help students investigate their interests in ways that allow them to demonstrate growth in the network's five learning goals by directing them to resources that allow them to explore the literary, mathematical, historical, and scientific elements of their projects and internships. This individualized, transdisciplinary support complements the learning students gain in dedicated courses and helps students incorporate core disciplinary concepts into their projects and performance assessments that support credit completion and growth.⁷⁵

Advisors also support students with learning gaps during advisories. For example, educators provide instructional support to students individually and in small groups, particularly in reading, writing, and mathematics, which are areas in which many entering Big Picture Learning students have difficulties.

The extended time spent in advisory creates an inclusive and restorative culture in which every student feels nurtured and conflicts are resolved constructively. A network leader explained:

You really create a space where kids feel known and that they're loved. We are creating opportunities for them to own their learning and then thrive outside—not even outside of school like in the internship—but it's more holistic. It's not just about a means to an end, getting credits, and graduating from high school.

The extended time in advisories also builds authentic and trusting relationships between students and their advisors, often leading advisors to advocate for their students and develop a long-term investment in their progress and trajectories.

A Glimpse Into Big Picture Learning Schools

It is a rainy morning in Burien, WA, just a few miles away from the bustling metropolis of Seattle. Twelfth-grade students, colloquially called 401s, are in their advisory spread out across their large classroom working on laptops. Four students are seated around a U-shaped table, while three students are seated comfortably on the floor with their backs resting against blue and white pillows. Additional students, returning from classes at local community colleges and technical schools, walk purposefully into the classroom. Peter, the 401 advisor, glances up to greet the group of students. The returning students calmly sit among their classmates or form pairs or trios at groups of desks.

Peter grabs a gray pillow and joins a student on the floor. While sitting down, he asks the student if she followed up with the financial aid officer at a state university. The student replies that she sent an email yesterday and plans to follow up with a phone call that afternoon.

He shifts the conversation to inquire about the student's internship at a Seattle-based design and architecture company and related progress on a senior thesis project (STP) proposal. Switching tabs on her laptop, the student opens a document named "STP checklist." Running through the list, the student explains that she completed her topic approval paper and convened the required panel of students and staff for feedback. She adds that she is currently extending the background research section of the proposal to include a brief history of architectural designs and urban development in Seattle—a suggestion she received during the panel. Peter agrees that the addition would strengthen the proposal's required historical context section.

Next, Peter points to the student's STP checklist and asks the student to explain the "theory of change," another requirement for the proposal and the purpose of the STP. The student describes her plans to create multiple design challenges for the company that would lead to employees' improved performance.

The origins of her theory of change stem from her recent experience building an in-school recording studio. She adds that the goal for her theory of change is for the design and architecture company to use her series of recommended design challenges as both assessments and routine practice exercises to improve the performance and collaboration of current and future employees and interns.

Before getting up from the floor, Peter reminds the student of next week's deadline for the draft of the proposal. The student affirms that she has planned how she will complete the remaining sections before next week's exhibition.

Next, Peter returns to his desk and picks up a binder titled “Learning Plans.” He joins a pair of students sitting across from one another at a group of desks. One student’s laptop screen displays a document titled “Exhibition Reflection.” Peter asks, “What are your thoughts on the feedback you received at yesterday’s exhibition?” The student replies that he agrees with his peers and staff that he had not written as many chapters as expected but is creating a concrete and realistic writing plan to complete at least three more chapters before the next exhibition. He opens Google Calendar on his phone to show designated times he allocated in the next 2 months devoted to writing. Peter replies, “I’m glad you’re using the calendar to get on track and organized. Last week we discussed ways for you to make your characters more compelling and to come to life for readers. Since you’ll be at your internship tomorrow, by Friday, please highlight where you have used those strategies.”

Moving swiftly across the room back to the U-shaped table, Peter tells students they will have to transition to their math class in about 15 minutes.

Peter sits next to a student who has returned from a course at the local community college. He tells the student, “I saw that your latest blog post got more hits than the previous posting.” Excitedly, the student shares, “I posted a screenshot of it on my Instagram page and asked a couple of friends to tweet about it. There were even views from Canada.” As the student opens the blog on her computer, Peter asks, “Are you planning to continue to incorporate segments of your personal and family history from your autobiography in your posts?” As time in advisory ends, he bounces between individuals and groups of students to check in and ensure next steps have been finalized.

Big Picture Learning’s record of growth and success

During its 24-year history, Big Picture Learning has spread its deeper learning approach and school design domestically and internationally. Early on in its existence, Big Picture Learning garnered national attention with its innovative approach and received grants in 2001 and 2003 from the Bill and Melinda Gates Foundation to spread its approach throughout the country. Big Picture Learning’s early expansion aimed to spread the whole school design in what Littky described as its “purist form.”

Yet maintaining fidelity to the Big Picture Learning design and its 10 distinguishers came with challenges related to administrative and accountability pressures in other states. Big Picture Learning school leaders in other cities grappled with these conditions and often implemented more conventional school structures that ran counter to the network’s original approach. These growing pains, aligned with the ending of the initial grant, caused the organization to rethink its approach to expansion. Big Picture Learning now supports its network-affiliated schools to adopt all or some of its 10 distinguishers or design principles, allowing the network to adapt its vision and structure for student learning to the constraints and opportunities of the schools’ respective locations.

With this approach to growth, Big Picture Learning has now expanded to serve approximately 26,000 students worldwide. In the United States, district public schools make up approximately two thirds (72%) of the network—many of which are designated as some form of alternative schools that include a wide range of student demographics and enrollment procedures. Traditionally, alternative schools are designed to support students whose academic and social and

emotional needs are underserved in conventional schools and/or who are at risk of educational failure (e.g., poor grades, truancy, pregnancy).⁷⁶ However, one Big Picture Learning senior leader indicated that the network preferred to call alternative schools “referral” or “re-engagement schools,” or spaces for students whose needs are not being met in conventional, comprehensive high school settings.⁷⁷ The remaining subset of schools operate largely as charter schools, with a few private schools as Big Picture Learning affiliates.

Much of Big Picture Learning’s growth has been initiated by district leaders who are interested in creating school options that are deeper learning focused or that provide a school environment that can re-engage students who have had challenges in conventional public schools. Local leaders often reach out to Big Picture Learning to inquire about its approach and feasibility. After exploratory conversations and site visits, the network has a more formal process, called a *School Success Study*, that describes how districts can build upon their current structures to feasibly implement Big Picture Learning’s deeper learning approach.

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The network has also generated strong student learning outcomes in implementing its student-centered learning approach. Studies have found that students at Big Picture Learning academically outperform their comparable public school counterparts on conventional test measures. An internal analysis conducted by the network found that math and English language arts test scores and high school graduation rates of students at four established Big Picture Learning schools surpassed those of their district counterparts.⁷⁸

External studies have corroborated these findings. The previously discussed AIR study on the outcomes of 10 deeper learning networks included Big Picture Learning. Researchers found that students in these deeper learning schools scored higher on state literacy, numeracy, and science tests in comparison to students in matched schools, controlling for student characteristics.⁷⁹ A longitudinal study of postsecondary outcomes of Big Picture Learning alumni from 23 schools found that 47% of students in the graduating class of 2006 earned an associate degree, bachelor’s degree, or another credential, a proportion significantly greater than the national average for other students from low-income backgrounds.⁸⁰

With this record of success, Big Picture Learning has also begun to influence district, state, and sometimes national conversations around reimagining teaching and learning. Network leaders often thought-partner with host districts to consider how deeper learning might be adopted throughout the district. They have also worked with state-level policymakers around the development of policies that support deeper learning, competency-based education, and personalized learning and have influenced national education policy in places such as Australia around the use of performance assessments in university admissions.

Internationals Network for Public Schools

In response to the educational challenges faced by English learners across the nation, the Internationals Network for Public Schools has intentionally designed public schools that both challenge and support those students. As its foundation, the network views each student as unique. While all Internationals students are recent immigrants and English learners, there is wide variation in the needs of those students when they arrive for the first day of school. Students enter Internationals speaking over one hundred different languages at home. Some come having received substantial formal education in that language in their native countries, while others arrive having had little or no formal education. Some come with literacy skills, while others come speaking native languages that do not have a written form. Some come with their families, while others arrive unaccompanied. Despite these differences, all arrive wanting to learn English and to get an education to help them find their way in their new country.

To meet the widely varied needs of its students, Internationals is deeply committed to forging the best path for each student while leveraging the individual and collective strengths of its student population to enable student success. Internationals' mission is "to provide quality education for recently arrived immigrants by growing and sustaining a strong national network of innovative International High Schools, while broadening our impact by sharing proven best practices and influencing policy for English learners on a national scale."⁸¹ In order to uphold that mission, the network ensures all recent immigrant students have access to a quality education that prepares them for college, careers, and full participation in democratic society.⁸²

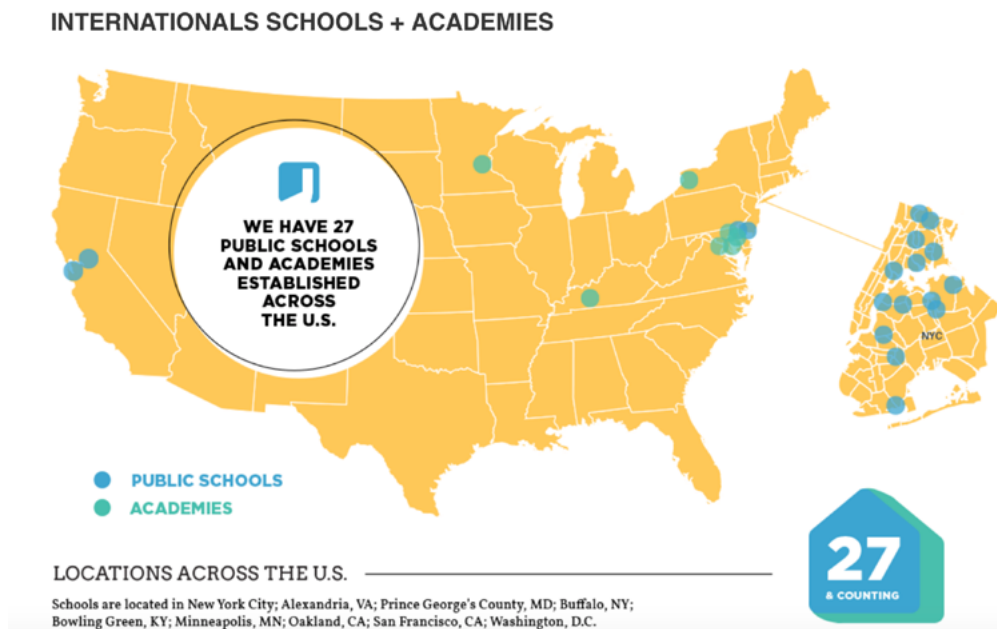
Internationals employs an approach that has more flexibility than the traditional U.S. high school, wherein the expectation has typically been that all students, including English learners, take a similar 4-year path to graduation. Instead, there is a shared understanding that each student must follow his or her own trajectory and that sufficient time be given for each student to reach the high expectations Internationals holds for him or her. While 4 years might be the right amount of time for some students, Internationals supports students who may need a 5th or 6th year to graduate ready for college, career, and life. In addition, throughout their time at

Internationals, students are afforded flexibility, especially linguistic flexibility, in the learning process. This flexibility is coupled with Internationals' integrated approach to language development and the consistent use of English as the language of common and academic discourse in network schools.

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The Internationals network started in 1985 as a single school, International High School at LaGuardia Community College in Queens, NY. Today, the network has 27 schools and academies, all of which operate as traditional public schools, in six states and the District of Columbia. (See Figure 5.) Together, the schools serve 9,000 students who are recent immigrants from 131 countries and speak 102 languages.

Figure 5
Map of Internationals Network for Public Schools



Source: Internationals Network for Public Schools. (n.d.). Schools and academies. <http://internationalsnps.org/schools/> (accessed 12/13/18).

The Internationals way of teaching

The expectation that every student will succeed if rigorously challenged, properly supported, and given sufficient time permeates the Internationals approach. That approach is undergirded by an evidence-based and deeply held belief across the network that the traditional method in U.S. schools of delivering language instruction in isolated English Language Development classes is deeply flawed.⁸³ Rather than isolating students in such classes, Internationals infuses language development—both of English and of the students’ home languages—directly into content-area classes. That is, English is taught while students are engaging in scientific inquiry, exploring a mathematical concept, or examining a social science challenge.

Common features of Internationals’ pedagogical approach include:

- the use of interdisciplinary, developmentally appropriate, and standards-based content to build knowledge;
- continuous emphasis on oral language development via formal and informal dialogue and exchanges;
- the use and development of native language materials and translation tools to leverage and enhance students’ language assets;
- frequent and scaffolded reading and writing tasks across disciplines;
- collaborative approaches that encourage more experienced students to model and mentor less experienced ones; and
- active teacher support during all forms of student learning that is gradually released as students gain skills and experience.

In addition to these features, instruction at Internationals is primarily organized around project-based learning, which further encourages the use and development of language (both English and home languages) and the application of academic skills and knowledge. Consistent with the research on language development, this active, engaged learning develops language proficiency by giving students frequent opportunities to hear, speak, read, and write.⁸⁴ As they develop and implement their projects, students use their emerging academic and language skills to investigate meaningful problems and collaborate with and learn from peers. In this process, students are actively encouraged to speak and write English while also using their native languages to support engagement with rigorous academic content. The use of tools such as Google Translate, texts in their home languages, and supports such as students collaborating and sometimes translating for one another are extensive at first and then gradually released over time.

The mix of support and high expectations in the Internationals model is further enhanced by the use of performance assessments, which reinforces the network's emphasis on integrated language development and deeper learning. For example, students in the 15 New York City and two California-based Internationals high schools use portfolios as a graduation requirement.⁸⁵ Other schools in the network integrate portfolios or performance assessments, but they are not officially recognized by their districts or states as a graduation requirement. Performance assessments are embedded into the curriculum and include defenses of academic performance in all subject areas. Biannually, students present and defend the work they have completed in each academic discipline to assess their progress in both the 9th- to 10th-grade and 11th- to 12th-grade cycles.

As is the case with the network's overall approach, considerable scaffolds are in place for the portfolio process. For instance, teachers support students in this process daily, helping students develop the skills and knowledge to successfully prepare and defend a portfolio of work. Furthermore, students remain encouraged to use language tools (e.g., Google Translate, dictionaries, thesauruses, sentence starters, graphic organizers) to craft their oral and written presentation materials. Lastly, Internationals staff describe the portfolio process as an iterative one. Students are given considerable time to iterate and practice their presentations, and in many cases, students will revise and re-present portfolios until the work is deemed proficient. This is a particularly helpful design feature of the portfolio process for English learners who, like other students, can thrive if given the chance to practice and iterate.

Seeing the Internationals Way in Action: Biology Class

The lesson of the day in a 9th- and 10th-grade biology class at San Francisco International High School (SFIHS) focuses on a central question: "Should soda have a tax?" Twenty-five students, roughly divided between 9th- and 10th-graders, include several students in both grade levels who are recent arrivals and have been in the United States for 6 months or less. Most of the class veterans have only been in the United States for 18 to 24 months.

Like other project-based learning environments, instruction for this heterogeneous class is connecting biology learning principles to real-world nutrition and policy. The veteran teacher, Patricia, has built extensive scaffolds into her lesson that were designed to meet students at their English language acquisition, content knowledge, and skill development levels. She moves through the classroom engaging individual students, small groups of students, and the whole class.

She intentionally leverages the assets that her students have brought to the classroom, particularly their native language fluency. The core question was written in English and in the five other languages spoken by the students in the class to give students an immediate starting point in their native languages that allows them to engage with the content questions even if their English language skills were not yet developed to the point of allowing them to do so fully in English.

The teacher uses other techniques that allow students to use their native languages to support themselves and one another in engaging with the rigorous content. For example, throughout the classroom, students use Google Translate to translate words from Spanish, Arabic, and other languages. In contrast to classrooms in which students' native languages are minimized or seen through a deficit lens,⁸⁶ students leverage their home languages to make meaning of complex grade-level academic content. With students from multiple linguistic backgrounds, English is the common language and the language of formal academic discourse. Yet English is not positioned as the only valuable language. The assets-based classroom environment makes students comfortable taking risks to speak, read, and write in English, but they also use their native languages as a valuable tool to be harnessed and developed.

The teacher also takes steps to make instruction and content accessible and to further students' vocabulary and writing development. For example, she prominently displays visuals from earlier lessons that students have labeled, and she has research articles and documents readily available so that students can access them through the inquiry process. In addition, each portion of the lesson is carefully chunked into discrete sections to allow students to understand the content and to apply their emerging English skills. For instance, students engage with pictures relevant to the soda tax debate and connect those pictures with academic English words they have learned in previous lessons (e.g., "glucose"). One chunked exercise includes the following stages:

- Each student chooses one picture and labels it in English with scientific terms that have previously been taught.
- In small groups, students discuss the pictures using English:
 - What did other people write?
 - What did it make you think?
- Next, using the labeled pictures from their groups, students individually write "a complex sentence—a big sentence" in English that can be used in their final essays.
- In doing so, students need to use the English words "but," "because," or "so."
 - E.g., "When you don't eat, the glucose decreases because your body uses the energy."

During the lesson, the teacher walks throughout the room meeting individually with students to make sure that they are receiving the supports they need to successfully engage with the language and content. She also constantly moves her hands, draws pictures on the board, points to visual scaffolds on the walls, and makes motions that have meaning as if she is playing a 90-minute game of charades with the students. She also has developed a series of sounds that are not English words but that the students associate with an action (e.g., an action that encourages students to look at their peers who are speaking or an action that encourages students to use sentence starters that are on the walls). This simple yet effective method seems to help ease the cognitive load for her students who are doing far more than the typical native English speaker would be doing in such a class. She repeatedly reminds her students of her expectations for participation and reinforces participation and structural routines to keep students engaged.

Eventually, students build from these smaller tasks to craft thesis statements and ultimately write persuasive essays in English that support their position on the value of soda taxes. While the development of academic English related to the content is clearly scaffolded through these steps, the teacher also has an explicit focus on science, engaging the students on both the science behind how sugary drinks affect humans and the social science behind their impact on communities. Over the course of multiple weeks, students develop the content knowledge and the English literacy skills needed to engage orally and in writing on the topic in sophisticated ways.

Supporting students holistically at Internationals schools

Internationals uses a range of approaches and structures to attend to students' holistic needs. To begin, the network embraces the wide variation in cultures present in its schools. At San Francisco International High School, for instance, flags from students' home countries are on prominent display as you enter the school, and the school makes extensive efforts to engage and connect new families with others in the community. These efforts create a welcoming and inclusive environment for students, which serves as the foundation for the rigorous learning they will engage in at Internationals.

Internationals schools also have personalization structures, including advisories in which students develop relationships with adult advocates who provide or connect students to supports for social and emotional development. Advisories are intentionally included in the Internationals model so that every student and family in the school is known deeply by an adult in the school. They also provide academic support, helping students prepare for portfolio defenses and with the college application process. To this end, each 9th-grader is assigned an advisor, usually a teacher, but it can also be a school leader or other school staff (e.g., counselors). Advisors meet with their advisees two or more times a week and work with students for 2 years before they transition that responsibility to new advisors who will work with students for 11th and 12th grade.

The network uses a distinct interdisciplinary team structure, wherein educators share small cohorts of students across disciplines and meet at least weekly as a teacher cohort (and with non-teacher advisors, such as counselors) to discuss their common students. This collaborative time is critical to the Internationals way. It puts individual students at the center of adult conversations and allows educators to refine their approaches to supporting students.

The network also provides wraparound services (e.g., health clinics, housing support, immigration, and employment services) and invests heavily in supplemental staff (e.g., social workers, counselors, etc.) to address the physical, social, and emotional needs of students and families so that they can overcome obstacles and ensure their overall well-being. Taken together, these features combine to create a strong web of support for students in the midst of the network's complex and rigorous deeper learning model.

This collaborative time [for teachers] is critical to the Internationals way. It puts individual students at the center of adult conversations and allows educators to refine their approaches to supporting students.

Internationals' record of growth and success

Most of Internationals' 27 schools and academies are located in New York City, where the network maintains 16 affiliates. Internationals also supports sites in Alexandria, VA; Prince George's County, MD; Buffalo, NY; Minneapolis, MN; Oakland, CA; San Francisco, CA; West Contra Costa, CA; and Washington, DC.

Network leaders indicated that local educators, community-based organizations, and districts had often approached the network with an interest in opening a school to meet the needs of immigrant youth who are English learners in their communities. Joe Luft, the Internationals Executive Director, explained:

I would say all of the growth up until fairly recently has largely been through people who have come to us. As we've grown and as word has gotten around about our work, people call us, email us; we meet people in conferences or meetings, and they ask about working with us.

Internationals is still approached by interested school districts and communities, but in recent years, it has explored the possibility of developing regional hubs—clusters of Internationals schools close to each other in a district or city—to facilitate support and cross-school learning.

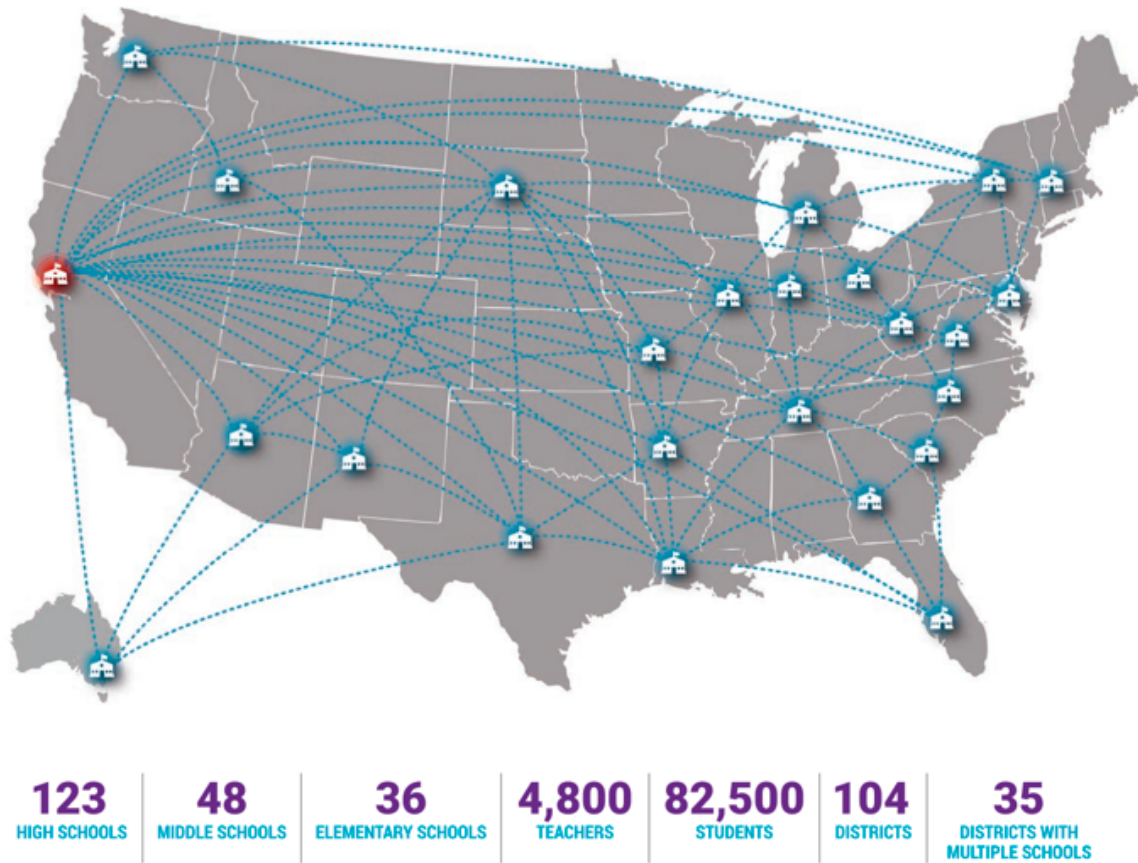
Several descriptive studies show that Internationals schools have generated strong outcomes for its English learner, recently immigrated students.⁸⁷ According to the network's internal analyses, students attending Internationals schools consistently outperform their English learner counterparts in schools that serve students facing similarly challenging circumstances.⁸⁸ External studies have corroborated these results, noting that Internationals schools' graduation, college acceptance, and matriculation rates are higher than those of their counterparts in New York City public schools.⁸⁹ Overall, in providing rich learning experiences for their English learner and recent immigrant students, data suggests that Internationals is supporting their learning and is advancing much-needed educational equity for this often-marginalized student population.

New Tech Network

New Tech Network partners with schools and districts to either redesign an existing school or develop a new school, aligned with the network's vision for student success: college and career readiness for all students. Each school in the network is unique, but all schools in the network experience the same rigorous design and development process, and all use project-based learning supported by the use of technology as a pedagogical framework. New Tech Network's approach to school design and support is ever evolving, as it remains responsive to the needs of its partner schools. This adaptable approach is the result of the network's experience partnering with schools and districts over the last two decades as it has learned to support the design and development of schools in varying contexts.

New Tech Network's flagship school opened in 1996 and was collaboratively developed by Napa Valley Unified School District, educators, and community stakeholders who saw a need to better prepare the region's high school students for the contemporary workplace. In 2018, still responsive to the needs of individual schools and communities, New Tech Network has grown to support a total of 207 elementary and secondary schools in 104 school districts across 25 states and Australia (see Figure 6).⁹⁰

Figure 6
Map of New Tech Network Schools (2017–18)



Source: New Tech Network. (2018). *The power of us: New Tech Network school and student success 2018*. Napa, CA: New Tech Network.

New Tech Network currently serves a student population that is 19% African American; 1% American Indian; 5% Asian/Pacific Islander; 28% Latino/a; 4% multiracial or other; and 43% White.⁹¹ Twelve percent of New Tech Network students receive special education services, and 11% are English language learners.⁹² Approximately 58% of all students in New Tech Network schools receive free or reduced-price lunches.⁹³ A total of 82,500 students are currently enrolled in the network’s 123 high schools, 48 middle schools, and 36 elementary schools.

Expanding equity and inclusion

New Tech Network schools welcome diversity in ability levels. Students come to New Tech Network schools with varying strengths and struggles: Many are performing below grade level in reading and math, are English learners, and/or have Individualized Education Plans (IEPs).

This heterogeneity is at the core of the network’s vision for equity. New Tech Network believes equity is based on inclusion in, and equitable access to, deeper learning experiences for all students in all of its schools regardless of race, economic status, or ability. New Tech Network’s dedication to project-based learning is rooted in its belief that “PBL [project-based learning] is for every kid”

and that it “creates [the] opportunity for every student to get their step in.” As one network leader described, New Tech Network’s project-based learning model strives to include all students in the learning:

When you’re teaching students, and you’re doing it more direct instruction, you tend to only have a certain group of students, or a certain student that’s interested in that topic, involved in the learning. As much as you try to get them all included, sometimes you leave students out, but when it comes to project-based learning, you put them into groups, and each one has ownership of what’s going on and responsibility of what needs to be done. There’s no sitting in the back and getting lost anymore—or just sitting in the background and taking in the information without being actively involved. This forces those students to come out of that background and actually be active in what’s taking place. That’s the beauty of it. It’s turning over the learning to the students.

New Tech Network works with schools to develop project-based learning structures and supports necessary for all students to achieve the network’s vision of college and career readiness. If a New Tech Network school is not at a place where all of its students are achieving the New Tech Learning Outcomes, the network works with school leaders and coaches to diagnose why and to identify what needs to happen to get there. This focus on student success gets integrated into each school’s culture so that all faculty and staff are empowered to provide systems of academic and social-emotional learning, including personalized supports that respond to students’ needs and address adversity.⁹⁴

All New Tech Network schools also aim to create inclusive learning environments that foster trust, respect, and responsibility among all staff and students. At New Tech Network, an inclusive and supportive learning environment provides students with authentic and meaningful challenges while creating school environments in which they feel safe to take academic risks as part of the learning process.

To develop supportive environments, teachers in New Tech Network schools build relationships with their students, creating a trusting and respectful environment that is necessary for project-based learning and the ambiguity that students face in the process. Advisories are one of the ways New Tech Network schools develop this culture. Advisories vary greatly in terms of structure, time allocation, and convening frequency across the network but are nonetheless common features of New Tech Network schools that build positive school culture. One New Tech Network school director described the importance of advisories and New Tech Network school culture on students through an illustrative example:

You can have the most introverted student, and then all of a sudden it’s like, “Oh, I’m a part of something bigger.” And that is huge for a lot of our kids because they come from tough family lives, sometimes, and it’s like just being a part of a family, being a part of something bigger, having teachers that care when you come back to school from being out and aren’t like, “Hey, you missed this; you missed this; you missed this.” They’re like, “Hey, are you OK ?” And it’s so simple, but it makes a world of difference.

Finally, teachers not only develop trusting relationships with students, but also with colleagues. This school culture and communication trickles down to students as teachers and school leaders model what trust, respect, and responsibility look like.

New Tech Network’s school design and pedagogical model





New Tech Network does not operate schools. It is a nonprofit organization that partners with schools and districts to either redesign an existing school or develop a new school. Instead of running schools, New Tech Network responds to the needs of the individual school and district while collaborating with them to support the development of one or more project-based learning schools and building their capacity to sustain and continuously improve teaching and learning.

New Tech Network schools can take several different forms depending on the state or local context. Ninety percent of New Tech Network schools operate within traditionally structured public school districts. Approximately half of New Tech Network schools function within their districts as neighborhood schools, while the other half are schools of choice within their districts through policies such as open enrollment. As of September 2018, 44% of New Tech Network schools are in urban areas, 24% are in suburban areas, and 32% are in areas designated as rural and town.⁹⁵

Regardless of the school classification or governance structure, each New Tech Network school adopts four core principles (or “design pillars,” as New Tech Network refers to them) used network-wide. (See Figure 7.) These design pillars are meant to guide schools and teachers as they make decisions, and New Tech Network believes all schools should enact all four pillars in their schools.

Figure 7 New Tech Network’s Design Pillars

The New Tech Model for school success is based on four design pillars:

-  **Culture that Empowers**
By making learning relevant and creating a collaborative learning culture, students become connected to, engaged with, and challenged by their school, their teachers and their peers
-  **Teaching that Engages**
Through project-based learning, students become problem-solvers
-  **Technology that Enables**
Through a technology-rich environment, teachers and students create, communicate, access information, and experience self-directed learning
-  **Outcomes that Matter**
New Tech Network learning outcomes measure collaboration, written and oral communication and the development of student responsibility for their own learning, or agency

Source: New Tech Network. (2016). *Together we can create a nation proud of its public schools*. Napa, CA: New Tech Network. <https://newtechnetwork.org/wp-content/uploads/2016/07/NTN-1-Page8-24-16.pdf>.

The “outcomes that matter,” listed as one of the design pillars, are a set of skills and competencies the network believes all students need to be ready for college, career, and life. (See Table 1.) This set of outcomes connects New Tech Network’s work to deeper learning. The outcomes were developed over time “through collaboration with teachers, university academics, the business community, and [were] informed by research.”⁹⁶ These outcomes align with the deeper learning competencies

that have been identified as the skills all students need to succeed in the 21st century and take them a step further by enumerating concrete skills, such as the ability to listen and comprehend when communicating effectively and seeking challenge and growing from setbacks. These tangible skills are combined with other locally identified outcomes to form a school’s “graduate profile,” or what each school hopes each of its students will be able to know and do by the time each student graduates.

Table 1
New Tech Network’s Learning Outcomes

Outcomes	Components
Knowledge and Thinking	Mathematical problem-solving; English language arts analysis; research and argumentation; science argument; explanation and research; social studies argument and explanation
Agency	Ownership over learning (examples include seeking feedback and active participation); development of a growth mindset (examples include seeking challenge, growing from setbacks, and building confidence)
Collaboration	Contributes ideas; equal participation; group norms; respectful tone and style; positive body language; active listening; roles; work ethic; team support
Oral Communication	Interpersonal communication (examples include listening, comprehension, and asking questions); presentation (examples include clarity, use of evidence, and use of visual material)
Written Communication	Development; organization; structure; language and conventions

Source: New Tech Network. (2018). New Tech Network Learning Outcomes. <https://newtechnetwork.org/resources/new-tech-network-learning-outcomes/> (accessed 03/14/19).

Because each New Tech Network school is unique, these design pillars are important for ensuring all schools in the network have the same priorities aligned with the New Tech Network student learning vision.

New Tech Network’s school model

New Tech Network co-designs schools with local leaders and educators that are grounded in project-based learning and the creation of inclusive school environments.

New Tech Network’s version of project-based learning has evolved to include a specific project sequence that all students and all teachers use, regardless of class subject or grade level. Though each project will look different, the project sequence always begins with teachers collaborating on the development of a project-based learning unit, followed by a project launch to get students excited and curious, and concluded by authentic demonstrations of deeper learning and

opportunities for reflection. The professional development that New Tech Network provides to its schools is geared toward building the capacity of educators in project-based learning and, in most cases, is also project-based.

As teachers develop projects for their classes, they often work with community members to identify authentic problems and/or culturally relevant questions for students to try to answer through the completion of their projects. These questions always aim to spark students' curiosity. For example, a guiding question for students in a bilingual studies (English and Spanish) class read, "How can our stories defy stereotypes and create understanding and acceptance among our community's many races and cultures?" Through a combination of workshop-based learning experiences, self-guided research, group work, and some direct instruction, students master the core academic content necessary to answer a project's question and ultimately develop a project that is personally meaningful to them. From start to finish, a project in a New Tech Network classroom can take anywhere from several weeks to several months to complete.

Many of these projects are also interdisciplinary, allowing students to make connections across subject areas. At the secondary level, some New Tech Network schools support interdisciplinary projects through courses that bridge subject areas, such as Everyday Mechanics, a physics and pre-calculus class, or Chemistry and Social Enterprise, a class connecting science, history, and social studies. Even when schools opt to have single-subject classes (e.g., Algebra II or World History), all teachers strive to make cross-subject and real-world connections.

Using authentic assessments for deeper learning

Throughout the course of a project, students aim to meet benchmarks set by the teacher, which can look like mini projects or performance assessments as part of the bigger project. These benchmarks provide feedback to teachers to see what students are grasping and what might need to be revisited for a subset of students or even the whole class.

All projects in New Tech Network schools culminate in an authentic assessment, presentation, and/or product developed by students. This can take many different forms. Students might do a presentation to a local charity, develop a website, or build something out of raw materials. All students in New Tech Network schools, however, are assessed on common rubrics that measure whether their work demonstrates an emerging, developing, proficient, or advanced level of each New Tech Learning Outcome (Knowledge and Thinking, Agency, Collaboration, Oral Communication, and Written Communication). Teachers have been trained on how to use these rubrics, and students are aware of how their learning is assessed throughout the project process. Students also engage in peer assessment throughout the project process, giving teachers more data about individual student agency, collaboration, and communication. At the end of each project, students reflect on their learning based on these outcomes and also on the project as a whole. This not only gives students an opportunity to reflect on their growth as a learner, but also gives teachers an opportunity to hear from students about their experiences with the project, giving them insight into how to improve project units in the future.

Overall, these authentic assessments enable students to apply their knowledge in meaningful ways, to receive feedback that helps them improve their learning, and to develop deeper learning competencies at the center of New Tech Network's instructional vision.

New Tech Network's record of growth and success

After district and community stakeholders collaboratively designed and opened the network's flagship site in Napa, CA, in 1996, the school received recognition for its students achieving higher than average test scores and for its ability to integrate technology into the classroom. This led to visitors from across the state and country coming to observe the school, with the goal of taking back ideas for school improvement to their own communities.

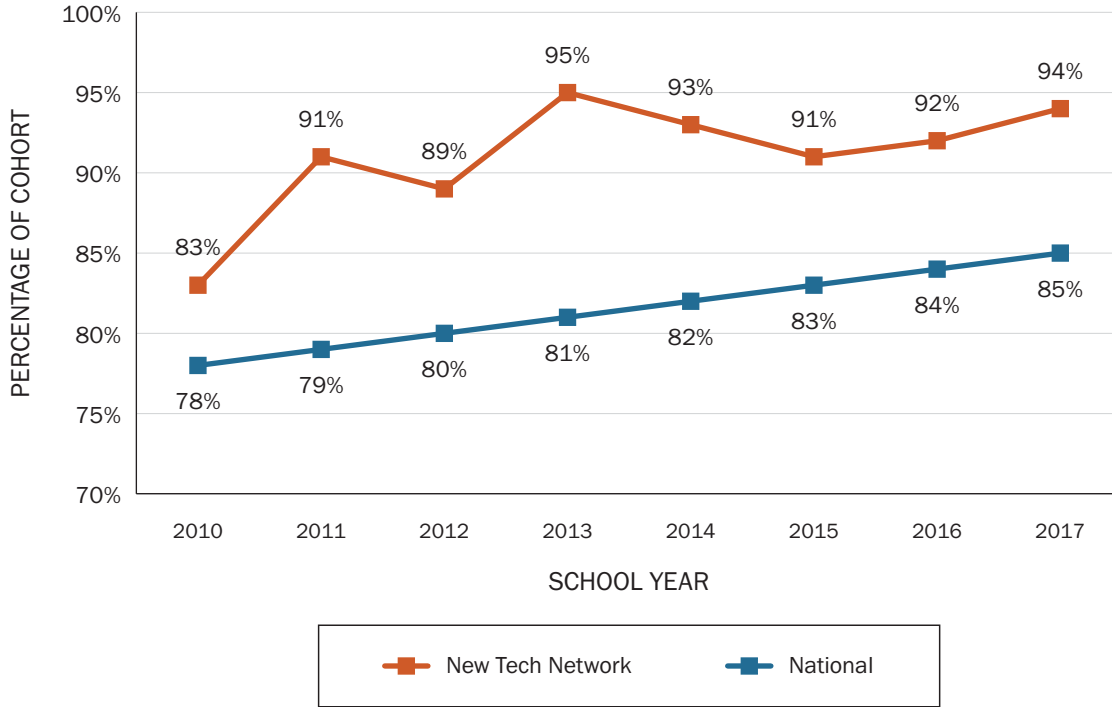
The growing recognition also led to a 15-year period of rapid expansion for the network. By 2012, New Tech Network had supported the opening of its 100th school. According to New Tech Network's Chief Executive Officer, Lydia Dobyns, this rapid growth was due in large part to federal programs, such as Race to the Top and Investing in Innovation Fund (i3) grants introduced during the Obama administration, as well as financial support from both the Bill and Melinda Gates Foundation and the William and Flora Hewlett Foundation. Since then, the network has expanded its deeper learning school model to over 207 elementary and secondary schools nationwide.

Even though New Tech Network has over 200 schools, it does not recruit schools to join its network. Instead, schools and districts seek out the network, usually because they want to create deeper learning environments or because they have heard about, or have seen firsthand, a successful New Tech Network school. During exploratory conversations, New Tech Network shares information about the network with district administrators, teachers, community members, teachers unions, and school board members and poses questions to understand the level of the district's motivation and commitment for wanting to join the network. Once both parties ensure they are aligned in their commitment to deeper learning, they move forward with a more formal process in which the network works closely with local leaders to co-design a school that addresses educational needs in the community.

Over the years, New Tech Network has continued to generate strong student learning outcomes. New Tech Network's internal research shows that New Tech Network students consistently graduate high school at higher rates than the national average. (See Figure 8.) Students in the class of 2017, for example, graduated New Tech Network high schools at a rate of 94%, nine percentage points higher than the national average for public high school graduates that year. Using National Student Clearinghouse data, this research also shows that students graduating from New Tech Network high schools persist in 2-year and 4-year colleges at a rate of 83%, five percentage points higher than the national average of 78%. These findings are corroborated by several peer-reviewed studies, as is New Tech Network's success producing college- and career-readiness outcomes in high-poverty communities.⁹⁷

Figure 8
New Tech Network's Graduation Rates Over Time

Average Cohort Graduation Rates



Data sources: New Tech Network. (2018). *The power of us: New Tech Network school and student success 2018*. Napa, CA: New Tech Network. Public high school 4-year adjusted cohort graduation rate (ACGR) is available by year from the Common Core of Data maintained by the National Center for Education Statistics. For 2016–17 data (the most recent available at time of writing), see: National Center for Education Statistics. (2018). *Table 1. Public high school 4-year adjusted cohort graduation rate (ACGR), by race/ethnicity and selected demographic characteristics for the United States, the 50 states, and the District of Columbia: School year 2015–16*. https://nces.ed.gov/ccd/tables/ACGR_RE_and_characteristics_2016-17.asp (accessed 05/14/19).

In addition to advancing student outcomes in its schools, New Tech Network aims to support the growth of deeper learning on a broader scale so that more students have access to these rich learning experiences. To this end, the district works to build district capacity to support the implementation of policies and school designs that can bring its project-based learning approach to life in more settings.

Systems for Planting and Sustaining Deeper Learning Models

While sharing some common instructional practices, such as performance assessments, Big Picture Learning, Internationals, and New Tech Network have distinct deeper learning visions that they operationalize in their affiliated schools. Big Picture Learning grounds its approach in personalized learning, through which students explore their curiosities through work-based and interest-based learning experiences to develop interdisciplinary knowledge. Because it serves recently arrived students who are English learners, Internationals seeks to develop students' academic and language skills through rigorous learning experiences, including project-based learning, that provide students with numerous opportunities for verbal expression, vocabulary development, and explicit literacy instruction. At New Tech Network schools, students are immersed in project-based learning and are asked to investigate real-world, complex questions that are relevant and interest driven. By enacting these distinctive deeper learning visions, the networks show the diverse ways that deeper learning can be instantiated in schools and districts to meet students' needs and to foster deeper learning competencies.

To advance deeper learning, network schools also design schools that attend to students' social, emotional, and academic needs to ensure their success and well-being. Big Picture Learning, Internationals, and New Tech Network acknowledge that many factors shape student learning—relationships, family, socioeconomic contexts, and instruction—and come together to affect each child in a unique way. In turn, network-affiliated schools nurture the conditions for learning that support students along the developmental continuum and create structures that reach beyond the classroom to provide academic and social and emotional support.⁹⁸ These structures include the use of advisories to support students academically, socially, and emotionally; investments in building inclusive school cultures and climates; and access to wraparound services.

Network-affiliated schools nurture the conditions for learning that support students along the developmental continuum and create structures that reach beyond the classroom to provide academic and social and emotional support.

Despite the complexity of scaling and sustaining school models like those in network schools,⁹⁹ these three networks have managed this feat by using systems and processes to re-create their models in new contexts while adapting to the opportunities and constraints in local communities. Each network:

- designs schools and secures the necessary conditions that allow deeper learning to flourish in network-affiliated schools in local districts;
- works with local stakeholders to establish and sustain its deeper learning model, which builds collective investment in the model and enhances school capacity;
- has multifaceted systems for teacher professional learning that help educators instantiate deeper learning practices in new and existing sites;
- invests in leadership development to support site leaders in designing and sustaining schools for deeper learning; and
- maintains a learning orientation that allows it to continuously improve and refine its design to ensure quality and equity.

1. Designing Schools for Deeper Learning

Big Picture Learning, Internationals, and New Tech Network make their deeper learning visions concrete through instructional practices that provide students with relevant learning experiences while attending to their holistic needs. Yet adopting deeper learning pedagogies in individual classrooms is often insufficient. To ensure that deeper learning is sustained and actualized, networks ensure that whole schools are designed so that deeper learning can flourish.

To this end, networks have identified the necessary structures, often called “prerequisites,” for their pedagogical models to flourish, which include rethinking the use of time to support student learning, the structure of teachers’ work, and the ways in which students demonstrate proficiency. With a clear understanding of these enabling conditions, the networks, in turn, have worked to secure policies that allow these to take hold in host districts.

The necessary structures for deeper learning

Organizing adults and students for deeper learning

Given the complexity and ambiguity that deeper learning generates, network schools rethink how teachers and students are organized to do their work together. Because of this, a priority in restructuring teacher-student collaboration is relationship-building and personalization structures, such as advisories. Advisories are critical in all three networks for ensuring that students have long-term connections to adults who can support them in all aspects of their social, emotional, and academic development; who can serve as their advocates and trusted mentors; and who can problem-solve with colleagues and family members around needs that may emerge. The hard work of deeper learning requires a variety of personal and academic supports to enable students to develop the cognitive strategies, executive function skills, self-regulation, and resilience to succeed. These are often enabled and orchestrated through the advisory process, as well as through time that is added to the traditional school day and year for support and mentoring before or after school, on the weekends, or in the summer.

Equitable access to deeper learning also requires that students with challenging circumstances outside of school have help from adults who know them well and can connect them to resources they need. For example, in some of the Internationals high schools in California, as many as one third of students arrived in the United States as unaccompanied minors, and they are making their way through school with little adult support outside of school. Poverty, homelessness, food insecurity, and unsafe community conditions impact most of the students served by these schools in one way or another. The advisory structure, which connects students to other wraparound resources and services, is key to their success.

Another common practice for personalization and relationship-building is teacher looping, where students remain with the same teachers or advisors for multiple years. For example, at many Big Picture Learning schools, teachers remain with their advisories for 4 years. Looping not only enhances the development of meaningful relationships, but also helps ensure continuity in student learning, as Big Picture Learning students often extend existing projects and internships across their high school careers.

Looping is also used in Internationals schools where students in 9th and 10th grade stay with the same team of interdisciplinary teachers for 2 years. Students learn in these multi-grade classrooms where novices benefit from the support of their more experienced peers in the collaborative inquiry work that they undertake. Meanwhile, teachers can be more closely connected to and knowledgeable about their students and their learning over the 2-year period, and they can plan and problem-solve with their teammates. Network leaders explained that interdisciplinary teaching teams are the primary mechanisms through which teachers generate and provide academic and social-emotional support. This continuity supports the development of strong relationships between students and teachers and generates academic benefits, as teachers can use their knowledge of students' strengths and struggles to meet their academic and linguistic needs over a longer period of time.

While some schools in New Tech Network incorporate grade-level teacher teams and looping, many use co-teaching models to support interdisciplinary, project-based learning and personalization. To illustrate, in one co-taught class in a South Carolina high school, the teachers asked students to collaborate on a group project that allowed them to synthesize their knowledge of honors-level physics and pre-calculus while developing other skills (e.g., research, communication, and active listening). In this co-taught classroom and the many others in New Tech Network, having two teachers in the room—each with specialized knowledge that can support interdisciplinary exploration—enables students to engage in investigations with appropriate supports and guidance. It also provides a venue for teachers to co-plan and problem-solve around content and students together.

Structuring schools that support deeper learning also requires that teachers have frequent opportunities to collaborate within and across grade-level content areas. For example, a common structure in network schools is the use of grade-level teaching teams that share a group of students around whom teachers can plan interdisciplinary curriculum and for whom they can bring shared personal attention

to individual student progress and needs. These teams typically have planning time together for these joint purposes, which produces a more coherent and caring experience for students—as well as more engaging curriculum experiences that draw connections between and among courses, ideas, and projects.

To illustrate, Internationals schools have teaching teams of educators who share cohorts of students across disciplines and meet at least weekly as a teacher cohort (and with non-teacher advisors, such as counselors) to discuss their common students. For example, 9th- and 10th-grade math, English, social studies, and science teachers share a common set of students and meet weekly as a team with a subset of other school personnel who serve as their students' advisors to discuss those students and their progress. Network practitioners noted that this structure puts individual students at the center of conversations and allows educators to collaboratively refine their approaches with each

Structuring schools that support deeper learning also requires that teachers have frequent opportunities to collaborate within and across grade-level content areas.

individual student so that they can contribute to their overall growth and well-being. The regular collaboration also encourages educators to continually improve their practice in conjunction with their colleagues and makes their peers aware of what is happening in one another's classes.

Overall, these networks' designs for personalizing instruction for students ensure that teachers have opportunities to collaborate. Practitioners affiliated with each of the networks note that their schools built schedules that allowed for frequent and consistent collaboration among and within grade levels and disciplinary teams so that teachers could discuss challenges and opportunities to improve teaching and learning.

Rethinking how time is used for student learning

As the networks reconceptualize the work of high school, they generally rethink how time is used in schools and create flexible master schedules that allow for extended learning opportunities and relationship-building through structures such as advisories. For example, at New Tech Network schools, schedules often include extended learning blocks so that students have ample time to engage in project-based learning with their peers and regularly participate in advisories. Similarly, Big Picture Learning schools utilize large blocks of time for advisories, for which extended time is reserved for students to engage in independent work and for teachers to confer with students so that students can explore the interdisciplinary dimensions of their interests.

The creation of flexible master schedules is also necessary to accommodate outside-of-school learning opportunities, which at times require amendments to how students can meet state or local seat-time mandates. For instance, to supplement their educational programs, each network encourages students to attend courses at local community colleges so that students can pursue their interests, develop interdisciplinary expertise, and better prepare themselves for the opportunities and challenges of postsecondary learning. In addition to participation in college-level courses, flexible schedules support work-based learning. Each of the networks has students participate in internships that occur outside of school during school hours. This structure for deeper learning is particularly prominent in Big Picture Learning schools, where students participate in internships each year. In order to implement workplace learning, schedules must allow for students to be out of the school building on varying days of the week to conduct informational interviews, participate in shadow days, and regularly attend their internships.

Finally, rethinking the use of time for deeper learning may also include considerations about the length of time students need to develop the academic and language skills necessary for graduation. This practice is most notable in Internationals schools, which often receive students in 9th grade with little formal schooling outside of the United States, some of whom need to work to survive while they are in high school, and all of whom need to meet a rigorous set of graduation standards that prepare all students for college while also mastering English as a brand new language. Instead of asking students to proceed through a conventional 4-year path, Internationals schools seek to design a success path for each student that has more flexibility. As such, there is a shared understanding that each student must follow his or her own trajectory and that sufficient time be given for each student to reach Internationals' high expectations. While 4 years is the right amount of time for most students, Internationals proactively supports students who may need a 5th or 6th year to graduate ready for college, career, and life.

Interdisciplinary Teacher Collaboration in Internationals Schools

Interdisciplinary teaching teams are the backbone of all Internationals schools, allowing teachers to work collaboratively to support student needs.

An interdisciplinary team meeting at International High School for Health Sciences in Queens, NY, exemplifies the value of this approach. Five junior institute teachers (i.e., 9th and 10th grade) and a counselor gathered during a common prep time for an hour to discuss their shared few-dozen students. In the tightly orchestrated meeting, the educators discussed a variety of academic and social and emotional learning issues regarding their common students. They brought student data (in this case, anecdotes) to the meeting, shared their data, looked for patterns in order to understand student behavior, and developed solutions to address students' learning issues.

At one point, they focused on a specific student who was struggling to produce language in English or her native language, both written and orally. Each teacher spoke, and they looked for clues in each other's anecdotes on how best to engage the student and for strategies they might reinforce across classrooms. For example, the student's science teacher shared that she had asked for help once in the past week, and that was an encouraging sign. Her math teacher shared that the student had been asking for help more frequently in her classroom but still struggled to retain concepts and understanding. After each teacher shared, they discovered that the student had been doing better when paired with one other particular student, so the teachers agreed to encourage that pairing in the next week to see if it made a difference. The educators also discussed her home life, and the student's advisor said that she would be reaching out to the family. They also mentioned the likelihood that they would produce a referral for potential additional supports and agreed to consider this possibility again the following week.

Throughout the meeting, the teachers and counselor remained highly collegial with frequent laughter and a steady focus on the work at hand. This collegiality helped when they discussed challenging issues their students were facing, including a cluster of students who had come to the school after being displaced by Hurricane Irma in Puerto Rico and a special education student who was struggling despite intensive supports. Throughout, the use of well-established meeting protocols, a mutual agreement to stay on a tight timeline, and the in-depth relationships that the educators had built with each other and their students allowed the team to cover multiple topics.

Reimagining how students demonstrate proficiency

Because each network utilizes performance assessments and some form of interdisciplinary study, the networks also design schools so that students can satisfy credit and graduation requirements in alternative ways. For example, while still subject to and compliant with district, state, and federal policies, Internationals schools in New York City have worked to allow schools to use performance assessments in lieu of some of the five statewide Regents examinations that are required for graduation.¹⁰⁰ All Internationals high schools use a portfolio assessment model, incorporating performance tasks and presentations as a requirement for graduation. Big Picture Learning and New Tech Network sites also use performance assessments throughout their courses, and some have similarly incorporated these assessments into graduation requirements so that students can demonstrate their growth and proficiency in comprehensive ways.

Leaders at Big Picture Learning also described how they worked to codify and translate student learning and growth into the credit completion parameters established in their host districts and states. The network supports schools in showing how students' learning experiences meet the expectations for state and local graduation requirements across subject areas. In California, where specific state-approved courses (known as the A-G sequence) are needed for college admission, Big Picture Learning has mapped those courses to its own courses, projects, and student learning experiences and has achieved state approval of these approaches. Given its personalized, interest-based learning approach, Big Picture Learning seeks avenues that allow students to satisfy credit requirements by demonstrating content knowledge and good academic standing through interdisciplinary performance assessments and project completion.

Other structures to support distinct deeper learning approaches

The networks' distinct approaches have required them to develop some structures that are unique to their approaches. For example, to implement its technology-supported, project-based learning model, New Tech Network schools require that all students in the network be provided with personal computing devices (e.g., laptops, tablets, etc.) by their schools to facilitate the independent investigation inherent in project completion. With this school design feature, the network works with host districts to ensure that sufficient resources are available to allow for consistent access to technology and web-based platforms.

Internationals schools also have distinct design features to support the deeper learning of their recently immigrated, English learner student population. For instance, Internationals schools have mixed-aged classrooms, which includes classrooms with 9th- and 10th-graders or 11th- and 12th-graders. This practice recognizes that students are multidimensional and are not a single level for all areas of knowledge and allows students with more developed language and academic skills to support novice peers. In addition, because its model integrates academic content with language instruction, Internationals schools seek ways to incorporate language development into their core academic programming rather than engaging students in isolated or age-inappropriate instruction to help them "catch up" in their English skills.

Securing the conditions for deeper learning

In designing school models with these features, Big Picture Learning, Internationals, and New Tech Network actively work to secure policies and conditions that allow their models to take hold in host districts. Each of the networks maintains a set of necessary school design features, often called prerequisites, that include policies that allow for flexibility in scheduling, structures for teaching and collaboration, additional forums for fulfilling credit and graduation requirements, and other network-specific practices. In turn, the networks work with districts to codify these structures in Memos of Understanding (MOUs) and/or through state or district policy waivers for their schools to thrive in local settings. While these prerequisites vary slightly depending on the network model, they are all in service of ensuring that their models can be enacted in high-quality ways.

Each of the networks maintains a set of necessary school design features that include policies that allow for flexibility in scheduling, structures for teaching and collaboration, and additional forums for fulfilling credit and graduation requirements.

In addition to school design features, network leaders noted that MOUs often included provisions that would allow network staff to provide input on the selection of school leaders given their critical role in designing and sustaining deeper learning schools. For instance, Big Picture Learning leaders explained that this prerequisite for partnering with districts arose from earlier challenges that resulted from leadership selection. In a few instances in the network's history, principals had been selected to lead Big Picture Learning schools who had philosophical differences from founding leaders and/or the network's vision. These appointments, in turn, often undermined implementation of the network's school model, compelling the network to seek participation in this decision-making process.

Leaders with Internationals also described efforts to be included in the selection of school leaders when establishing an affiliated school. While teachers and leaders at Internationals schools are district employees with a range of experience, the network prefers to tap school leaders who have experience in supporting English learners or those from established Internationals schools who can transplant rigorous teaching and learning practices for English learners into new sites. In turn, Internationals aims to work with district partners to identify leaders and staff who have relevant experience with English learners and the right mindsets to learn the Internationals approach.

Network leaders also indicated that their efforts to establish deeper learning schools involved identifying how the district would work with the network to support school design and professional learning. To ensure that deeper learning can be implemented and sustained, MOUs between districts and networks include descriptions of network-led professional learning opportunities (e.g., access to network coaches and conferences) that aimed to support the practice of local leaders and educators. For example, when schools decide to partner with New Tech Network, they agree to participate in a multiyear design and implementation process wherein network staff support local educators and leaders in the design and rollout of their schools. Requiring districts to engage in this prolonged school design process with the support of New Tech Network staff has enabled the network to grow its model in high-quality ways that support the community and staff needs.

Taken collectively, these efforts provide the foundation for the networks to establish whole schools that are designed to implement and sustain deeper learning. Through their identification of key school design features and their efforts to codify these in MOUs, the networks are better able to set the stage for re-creating their models in distinct settings.

2. Partnering With Districts and Communities to Implement Deeper Learning

Big Picture Learning, Internationals, and New Tech Network design schools so that their equity-oriented, deeper learning models can be instantiated and sustained in traditional public district schools, providing a counterpoint to the common misperception that deeper learning can only be implemented in charter or independent schools. To do this, the networks maintain a set of policies and structures they aim to codify in local settings before establishing their schools so that their deeper learning models can be implemented in quality ways.

Although they adhere to these criteria, district-network partnerships are not unilateral; networks do not dictate all the partnership parameters. Instead, they collaborate with districts and communities to co-design and establish network schools and continue working with stakeholders to implement and sustain their models. This collaborative approach allows networks to scale their models in high-quality and context-sensitive ways, helping to ensure that their models are

responsive to local conditions and that the schools welcome the reforms rather than feel that the reforms are imposed on them. Moreover, it fosters a shared commitment, knowledge, and investment in deeper learning that helps sustain deeper learning schools in local communities.

Collaborating to establish network sites

Network leaders indicated that district partnerships typically have been initiated by local leaders and educators who are interested in the model and are followed by a series of informal conversations and school visits to explore a formal relationship. To illustrate, New Tech Network leaders explained that their process begins with targeted conversations with interested parties about their reasons for wanting to work with New Tech Network so as to verify mission alignment and commitment to project-based learning. Subsequently, New Tech Network provides local stakeholders with opportunities to go on “executive tours” in which they observe other New Tech Network schools that have similar student and community demographics, resources, and challenges so that they can see firsthand what is possible in their communities.

Leaders at Big Picture Learning and Internationals shared similar exploratory conversations and site visits, with Internationals noting how these initial interactions have more recently included discussions of the potential to open more than one school in a district. In its 30-year history, Internationals staff and school leaders have found value in having a sister school or schools nearby for reciprocal support and learning—a proximity that has further supported schools in understanding how to best meet the needs of English learners in a given area, including those that attend other district schools.

After these exploratory phases, both New Tech Network and Big Picture Learning engage in a more formal process in collaboration with local districts to establish their sites. For example, Big Picture Learning conducts a *School Success Study* consisting of interviews with stakeholders, including district officials, teachers, local business owners, and families, and classroom observations during a 1- to 2-day visit at the proposed site with the aim of assessing how the school could feasibly adopt the Big Picture Learning approach. A Big Picture Learning network leader explained the *School Success Study*: “We really look at any new school from an asset-based perspective. What’s already in place around real-world learning opportunities? What’s already in place around school culture, leadership, professional development, and family engagement?” After conducting the study, Big Picture Learning leaders prepare a report with tiered recommendations, allowing local leaders to assess the model’s feasibility and potential impact on the local community.

New Tech Network employs its own formal process for partnering with districts to establish sites. The network works closely with founding school leaders through a highly articulated process, often described as co-design, to develop schools that will address their community’s needs. Local educators then submit these designs in a formal application so that network leaders and district partners can develop a vision for ongoing network support in establishing a New Tech Network school.

Overall, the networks continuously work with local stakeholders to establish affiliated sites in public school districts. Through these collaborations, they ensure that their deeper learning models can be feasibly implemented and can provide local students with rich learning opportunities. Moreover, the networks include local perspectives in their efforts to instantiate their models, helping to ensure that their schools are responsive to local communities.

Working With Teachers Unions

Big Picture Learning, Internationals, and New Tech Network typically implement their models in traditional public schools, meaning most of the teachers are members of the local teachers unions, so their working conditions are subject to local collective bargaining agreements (CBAs).

Because teaching and learning in network schools vary from traditional school settings, network leaders noted that efforts to establish network schools often involved discussions with union representatives. For example, when Big Picture Learning partners with school districts to transform an existing school site, Big Picture Learning leaders indicated that they work with the unions to co-develop amended CBAs that allow union members to implement the network's deeper learning model in high-quality yet professionally sustainable ways.

Similar discussions and agreements between union officials and New Tech Network were also reported. According to New Tech Network leaders, conversations with teachers unions have varied by state and district, but New Tech Network has generally involved them in conversations as early as possible. Alan Veach, a Director of District and School Development at New Tech Network, described what this variation in union relationships can look like by discussing three states where New Tech Network partners with schools. Indiana, a state with close to 30 New Tech Network schools, is a right-to-work state, meaning teachers unions can bargain salary but nothing else. South Carolina, a state with 11 New Tech Network schools, does not have a teachers union, and Ohio, a state with 17 New Tech Network schools, has a teachers union with "significant power," according to Veach. The Director went on to say:

In those states where you have a strong teachers union, we try to engage them early. Even in a state like Indiana where you don't have a strong teachers union, whoever's on that bargaining committee is often still influential among the staff, and so we would often say, "Make sure you bring that person along." Having them in the know is better than them sabotaging just because they don't know and are making stuff up.

In some instances, network efforts to engage unions has caused unions to change their stances and even advocate for policies that support deeper learning-aligned practices. To illustrate, International High School at LaGuardia Community College was one of a set of schools in New York City to seek a waiver from the union contract and district rules to allow for the use of peer review, a process by which teachers assess performance and provide supports for their fellow teachers at a given school instead of using the traditional review process in which principals assess the performance of teachers. Today, other schools throughout New York City, including Internationals schools, have followed suit, with a supermajority of teachers voting to adopt a peer review system rather than a traditional administrator-only review system. The network and individual schools have also worked closely with districts and unions to work within union contracts and/or to create waivers to allow teachers to teach advisories, share students and have common planning time, and participate in performance assessment systems.

Collaborating with districts and communities to sustain deeper learning

The initial exchanges networks have with local stakeholders are only the beginning of their partnerships and interactions with communities and districts. In fact, each network partners with local stakeholders and external organizations to sustain their deeper learning school models across the country. Through these collaborations, network sites foster a shared commitment to deeper learning among families, districts, and communities and implement their learning models with support of local groups and institutions. In doing so, the networks are better able to instantiate and sustain their models in high-quality ways and in ways that extend the capacity of their school staff.

Ongoing work with districts

Big Picture Learning, Internationals, and New Tech Network engage in ongoing collaborative efforts with districts to sustain deeper learning. Some of these efforts are focused on building relationships with district leaders so that they are knowledgeable and supportive of network schools in the midst of leadership and policy churn. For example, school leaders at Big Picture Learning schools explained that they often held one-on-one meetings and hosted site visits with district and board members to help demystify the model. A district official at the Nampa School District, a host district for a network site, highlighted the power of site visits, in particular, as an effective engagement strategy: “What they don’t know is what they don’t know, so they need to see things.” Through these efforts, leaders explained that they develop relationships with individuals in the central office who ultimately serve as allies that help Big Picture Learning leaders anticipate and navigate conflicts as they implement the network’s vision.

Ongoing engagement with districts has also taken the form of professional development. For instance, while the network has faced challenges in securing adequate resources from districts, Internationals leaders highlighted how they have worked within some districts to build expertise in deeper learning practices for English learners that can be more widely adopted. They explained that several host districts have approached them to learn more about the network’s model. Joe Luft, Internationals’ Executive Director, described the nature of this engagement:

Our partnership with districts has grown beyond just one school or academy based on the success of our work. The deepening of these district partnerships has grown out of districts’ desire to spread the work we’re doing beyond one building and to impact the districts’ practices more broadly. This was true earlier on in New York City, as we’ve grown up to 15—soon to be 16—schools there.... We do host visits for educators from other schools and districts as well. We have included non-network educators in some of our professional development conferences and institutes.

Overall, Internationals has opened its doors to provide interested district educators with opportunities to extend their professional learning around deeper learning pedagogy for English learners, which has developed local expertise and investment in these approaches with the hope that these practices might be adopted more broadly.

New Tech Network has similarly engaged districts in professional development around deeper learning as a way to sustain its schools and to spread its practice into other district schools. For example, the network has created a suite of services, including in-person and virtual workshops, to support districts and local educators in understanding deeper learning practices and the school designs and policies necessary for their implementation. New Tech Network created these supports,

in part, because it views every level of a school system as important. As Jude Garnier, Chief District Officer for New Tech Network, described in a New Tech Network Annual Conference session for district and school leaders, “Systems are like nesting dolls. Everyone has to be a learner. Each level is responsible for the conditions of learning for the next level down.” In addition to involving personnel from every level of a system, these supports also serve to help new schools avoid an “us vs. them” mentality; something one district representative at the same session described as a risk when an organization, or those perceived as outsiders, are brought into a system to make changes.

Big Picture Learning has also worked with some of its host districts to consider how they might adopt and spread deeper learning into district schools. To illustrate, a regional director in Big Picture Learning’s Northwest region stated that he had participated in a host district’s strategic planning process and that the district’s vision now included elements that are characteristic of Big Picture Learning. He explained:

If you look at their strategic plan that was developed ... there are multiple pieces of the strategic plan that sound very Big Picture Learning and that I think were influenced by the Big Picture Learning school there. One of them is that the strategic plan says every high school student should have an internship at some point.... Another one is knowing every student by name.... There are a few places where it touches on student interest, and then there’s another piece about assessing in different ways, and there’s a reference to competency.

In other cases, Big Picture Learning leaders stated that host districts and community-based organizations were increasingly adopting advisory approaches and restorative practices to support students’ social and emotional needs. In this way, Big Picture Learning has worked with districts in ongoing ways to further expand its practices to schools outside of the network.

Ongoing work with community partners

Representatives from each of the networks also discussed how local partnerships support the implementation of deeper learning models. At Big Picture Learning, school leaders and teachers noted how collaborations with local businesses and community-based organizations create a supply of potential internship sites, which provide opportunities that lie at the foundation of the network’s interest-based learning model. International leaders also indicated that partnerships with community-based organizations help their sites meet the social and emotional needs of their student populations. Leaders stated that many community-based organizations provide their affiliated sites with social services, including mental health, housing, and immigration services, so as to offer the holistic supports their recently immigrated students need to succeed. Finally, New Tech Network teachers and leaders described how partnerships help support project-based learning. They mentioned how community members and organizations often supply New Tech Network educators with ideas and resources for project needs and often serve as authentic audiences for students during their performance assessments.

Many network-affiliated schools have also partnered with local institutions of higher education to extend student learning and to support students in their postsecondary trajectories. For instance, recognizing the challenges International students faced when moving from their deeper learning environments to higher education classrooms, some network schools, such as San Francisco International High School (SFIHS), have hired community college faculty to serve as part-time

teachers to create college pathways. According to network and site leaders, this has had multiple positive effects, including exposing SFIHS students to collegiate-level work, which makes the option of higher education more tangible to students and encourages collaboration between SFIHS and community college faculty on pedagogical approaches that are most effective for English learners. In another example, educators at Big Picture Learning in Burien, WA, and Nampa, ID, described how partnerships with local community colleges allowed students to take specialized courses to earn credits and to further learning around their interests. Because each Big Picture Learning student engages in a personalized, transdisciplinary curriculum, these learning experiences serve as opportunities for students to immerse themselves in academic content that supports their individualized learning trajectories.

On some occasions, networks partner with external organizations to extend professional learning among their educators. For example, in New York City, many Internationals schools have had a long-standing partnership with the New York City Writing Project (NYCWP). An affiliate of the National Writing Project, NYCWP is a professional development organization that uses its “teachers teaching teachers” model to improve literacy instruction.¹⁰¹ Designated NYCWP coaches often spend multiple days at Internationals, collaborating with teachers to provide individualized support and/or facilitating whole-school professional development in this core academic area. In partnering with NYCWP, the Internationals schools in New York City have aimed to improve educators’ abilities to be skilled language instructors—the linchpin of Internationals’ integrated and rigorous approach to academic and language development.

While varying in the purpose or form, network-affiliated schools have maintained partnerships with districts and community organizations that directly support student learning and the network’s pedagogical model. As a result, these collaborations have supported networks in instantiating their models by providing necessary resources, capacity, and sustainability. In addition, these efforts have been able to build local knowledge of deeper learning and have invested a variety of stakeholders in its spread and sustainability.

Funding network schools

Partnerships are critical to sustainability of these models. Big Picture Learning, Internationals, and New Tech Network secured seed funding from philanthropic groups or other investors at critical junctures in their organizational journeys, which helped them spread their approaches and develop networks of schools across the country.

Now they are funded largely through government funding that flows through their district partners. Because network schools are largely or exclusively district schools, schools affiliated with each network operate with funding allocations established by local, state, and federal statutes. For example, network and school leaders indicated that their schools rely on funding based on their average daily attendance counts, or counts of the number of students in attendance at their schools each day that are then averaged on a bimonthly or quarterly basis to determine any midyear adjustments to state aid. With the large portion of students qualifying for free and reduced-price lunch in network schools, leaders also noted that Title I funds were an additional source of funding that enabled schools to subsist.

Districts also contribute directly for some of the services networks provide. For example, all schools that partner with New Tech Network pay an annual fee for various supports, including professional development, coaching, and access to Echo, a learning management system that connects teachers

to a repository of projects that other teachers in the network have contributed as well as other New Tech Network–curated resources. As of 2018, the fees associated with the three distinct phases of school development are \$35,500–\$38,000 for design/planning services prior to opening; \$67,400–\$80,000 per year for 3–4 years of implementation at the high school level; and \$15,000 annually for continuation of services for mature schools. New Tech Network schools typically draw from their general budgets to pay this continuation fee, which can include local, state, and federal dollars.

Similarly, district–network contracts typically allocate funds to compensate Internationals for engaging partners in school planning or preopening activities, including leadership mentoring and intra-network visitations wherein new school leaders shadow leaders at existing network schools. Sometimes grant funding (in the range of \$30,000 to \$60,000) is available to supplement the preopening design phase. Network funds are sometimes used to support founding school leaders in designing schools. (These leadership development opportunities are explained in detail in the section “Developing Deeper Learning Leaders.”) New Tech Network leaders described a similar approach to investing in schools during their co-design and development phase. The network does not require partner districts to pay any fees until an agreement to move forward on the transformation or design of a school is reached. Thus, New Tech Network covers the costs associated with network staff time and educators’ attendance at national events while districts are still learning about the network. Thereafter, a shared funding agreement supports the work of redesigning schools and supporting educator learning.

Less frequently, network leaders described efforts by principals to secure grants or other sources of external funding to support specific programs and services. To illustrate, a Big Picture Learning school principal in the Pacific Northwest secured additional federal and private grants to support her alternative school and to secure an on-site child care center for her students, 25% of whom were teenage parents. New Tech Network leaders also support schools in pursuing funding to meet specific needs unmet by their district arrangements.

Overall, while network schools sustain their operations through government funding, the networks have also leveraged their partnerships with districts to ensure that their efforts to co-design schools and implement deeper learning are effectively resourced.

3. Implementing Multifaceted and Experiential Supports for Teacher Learning

Deeper learning pedagogies call for teachers to create meaningful tasks that ask students to make sense of content, build on what students know, use tools and routines that support effective collaboration and communication, offer authentic forms of assessments, and support metacognitive reflection and revision as part of productive struggle.¹⁰² These practices are not the norm in most school settings—partly because teachers themselves have not experienced these forms of learning, and preparation programs rarely provide them opportunities to do so.¹⁰³ In addition, these practices often run counter to many of the entrenched norms around social interactions in schools and beliefs in student ability, which enable more traditional forms of teaching and learning to persist.

Because the skills and competencies associated with implementing deeper learning pedagogies may be different than those needed in more conventional forms of teaching, Big Picture Learning, Internationals, and New Tech Network dedicate significant time and energy helping teachers learn new strategies through professional development and the provision of curriculum tools and resources. This section describes the multifaceted systems of support that each network has in place

to provide initial and ongoing professional learning supports and the experiential strategies used by each network to make adult learning mirror student learning. Through these professional learning opportunities, each network aims to develop the competencies and mindsets among their educators to support the implementation and sustainability of their deeper learning approaches.

Teacher competencies for deeper learning

Because deeper learning requires fundamental shifts in teaching and learning, Big Picture Learning, Internationals, and New Tech Network recognize the need for educators to develop distinct skills and competencies. To this end, the networks have identified attributes—many common across all three networks, with others unique to one network—they hope to foster in each educator through capacity-building supports. (See Appendix B for each network’s list of teacher competencies.)

Across all three networks, the desired attributes generally fall into one of two categories: (1) skills associated with the implementation of deeper learning pedagogies and (2) competencies associated with creating a positive school culture.

Skills for deeper learning instruction

With the distinct practices that characterize deeper learning, the networks have identified the pedagogical skills and knowledge teachers need to implement their deeper learning models. For example, New Tech Network, whose entire instructional model revolves around **project-based learning**, suggests that teachers should be able to utilize content understanding to design learning experiences that are complex and meaningful and use data and reflective practices to support student learning. Internationals also emphasizes that its educators develop skills related to supporting student-centered, project-based learning and performance assessments. They suggest that teachers should be able to implement collaborative projects that develop students’ linguistic and academic skills and embed performance assessments into their ongoing curriculum and instruction.

With its multifaceted deeper learning approach, Big Picture Learning notes that teachers should develop expertise in supporting real-world and interest-based learning. In addition, the network identifies the ability to support students in designing transdisciplinary courses of study (e.g., goal-setting, project management, problem-solving) that are connected to their interests and to guide students through formal and informal authentic assessments.

Because deeper learning engages students in personalized learning experiences, all three networks identify **differentiation** as another important competency. For example, Big Picture Learning describes differentiation in terms of enacting its “One Student at a Time” philosophy, creating individualized education goals and experiences for each student. New Tech Network highlights the importance of differentiation skills for project-based learning, including the need for teachers to strategically use **scaffolds** and **formative assessments** to ensure students have adequate supports throughout their project work.

Because deeper learning engages students in personalized learning experiences, all three networks identify differentiation as an important competency.

Internationals' definition of differentiation explicitly incorporates the needs of English learners. It suggests educators should be versatile in implementing necessary scaffolds to support English learners, including leveraging students' native languages to support English learning, explicit vocabulary instruction, the use of sentence and speaking stems, and ample opportunities for oral and written communication. This ability is associated with another network-specific competency that Internationals identifies: deep knowledge in language development and the ability to integrate language instruction across subject areas.

Competencies to support positive school culture

All three networks identify skills and orientations associated with building a positive school culture. While differing in how these competencies are labeled, the networks highlight the importance of **relationship-building skills** among their educators. For example, Big Picture Learning identifies relationship-building as a foundational competency, as it is necessary for fostering an inclusive advisory culture and for teachers' ability to co-design a learning trajectory with students over a 4-year period.

Internationals captures an emphasis on relationships by identifying a focus on the whole child and collaboration among colleagues as competencies central to implementing its approach. New Tech Network also emphasizes the importance of relationships by suggesting that its educators demonstrate interpersonal competence and be community oriented, seeking opportunities to better connect the school with the community.

Internationals and New Tech Network identify the development of relevant mindsets as important teacher attributes. New Tech Network suggests that its educators should develop and maintain a **growth mindset** and that teachers seek opportunities to lead and support other adults in their own growth and learning. Internationals also identifies a growth mindset as a critical teacher attribute and couples it with an explicit **focus on equity**. The network suggests that teachers should maintain social-justice commitments and have sophisticated **cultural competency** skills to work with immigrant youth from many different countries and cultures. (See "Culturally Validating and Restorative Practices in Network Schools.")

Overall, networks have identified skills and competencies for their teachers to effectively implement deeper learning and to foster the school cultures that allow students to be holistically supported. Through their systems of professional learning supports, they aim to develop these competencies in ongoing ways.

Culturally Validating and Restorative Practices in Network Schools

Students at Big Picture Learning, Internationals, and New Tech Network are often members of communities that face historic and ongoing social, economic, and political challenges. In supporting students from marginalized economic, racial, and linguistic groups, network schools are cognizant of the need to create identity-safe environments where students of all backgrounds are validated and where students can grapple with the challenges that emerge from the intersection of their identities.

Network schools seek to create culturally validating school environments where students are known and celebrated. Each of the networks accomplishes this, in part, by using deeper learning approaches that promote student voice and agency. Advisory structures in network schools also create opportunities for teachers and students to build trusting and positive relationships that can serve to develop a sense of inclusion and support.

In addition, students' cultures and funds of knowledge are often infused in curriculum and instruction to enhance learning. For example, a staple of the Internationals approach is to celebrate and leverage students' native languages and knowledge of their home countries when exploring content across subject areas. Big Picture Learning also seeks to validate student identities by having them explore their backgrounds and the issues facing their communities through their autobiography and autoethnography projects—two multiyear projects that students use to ground their transdisciplinary learning.

Staff members at Big Picture Learning's Union High School in Nampa, ID, collectively created an Equity Action Plan, which included staff training on trauma-informed practices and the expansion of cultural learning experiences. With the latter, students visited the local Hispanic Cultural Center and Boise State University's Tunnel of Oppression, an interactive theater designed to show the oppression of marginalized groups to deepen their understanding and learning around social and political issues that affected their community.

Teachers and leaders at network-affiliated schools also indicated that they engage in restorative justice practices in advisories, which can further enhance learning and well-being for students from marginalized backgrounds. To illustrate, advisors at Big Picture Learning's Union High School use restorative circles at the beginning of each day to check in with students while providing them space to respond to current events that often affected their social-emotional states. Union High advisors also noted that restorative circles were used throughout the day as conflicts and challenges emerged so as to engage students and teachers in educative and productive conflict resolution and discussions.

Supporting teacher learning

The networks have developed multifaceted professional learning systems to support educators in implementing their models in high-quality ways. Big Picture Learning, Internationals, and New Tech Network each provide in-person professional development opportunities by facilitating professional gatherings, allowing educators to see network instructional models in action, and providing direct support through coaching. In addition, each network provides resources through its own online platform. Overall, these structures allow the three networks to provide both initial and ongoing support to educators in their networks.

Network-led professional gatherings

Big Picture Learning, Internationals, and New Tech Network gather educators from across their networks for shared, in-person learning experiences. These gatherings are intended to introduce educators to the foundational elements of the model, provide opportunities for continuous learning and professional development, and build a shared sense of community and purpose.

These professional gatherings occur in a number of formats. For example, one format for in-person gatherings is a set of annual or semiannual conferences that bring together new and veteran educators from across the country to attend workshops intended to sharpen deeper learning practices and build a sense of community each summer. At Big Picture Learning's conference, breakout sessions, which are attended based on individual interests and school needs, include topics ranging from developing advisor competencies, launching an internship program, and project-based learning to establishing an inclusive school climate. Similarly, New Tech Network's New Tech Annual Conference offers three different learning tracks for attendees who are planning to implement or are currently implementing the network's deeper learning model. These tracks allow the network to offer tailored, specific supports to educators at various levels of the school development spectrum and to educators with or without prior exposure to project-based learning pedagogies.

Internationals also gathers educators for shared learning at its summer and fall professional development conferences. These gatherings offer an array of learning opportunities intended to deepen teacher understanding of the network's core principles. Teachers can attend workshops on topics including supporting students who have just arrived in the United States, developing English language writing and verbal skills in math and science classes, leading an advisory, differentiating instruction and effectively utilizing small groups, and supporting recent immigrant students in securing housing and employment. These workshops are led primarily by Internationals educators who model features of the Internationals approach to provide participants with strategies and tools that they can apply in their practice.

The networks also gather educators for smaller shared learning experiences throughout the school year. For example, Big Picture Learning gathers educators for regional convenings where teachers share resources for improving teaching, advisory, and facilitation of students' personal learning plans and internship experiences. These are typically free-flowing dialogues in which participants respond to this central question: "What are some struggles and successes you've been having?" Internationals educators have similar opportunities to gather and discuss a topic of interest or attend panel presentations that showcase innovative practices from across the network. At each Internationals gathering, there is also time for teachers to present student work and to calibrate their assessments of its quality, a practice intended to sharpen their skills and maintain the rigor of the network's instructional practices and performance assessment system.

Overall, these in-person gatherings provide educators with opportunities to develop cross-network relationships as well as to develop the technical skills associated with their network's model, including skills associated with project-based learning, performance assessment, and other desired teacher attributes. They also serve as forums that can develop a shared sense of purpose and deeper learning knowledge among their practitioners in an ongoing way, which supports the networks in implementing their models.

Opportunities to observe deeper learning

Each network also creates opportunities for new and veteran educators to see deeper learning and their specific network models in action. Networks use this strategy at different stages of school development and professional development and for multiple reasons. These reasons span from providing educators who are new to the network with models of deeper learning to creating spaces for educators to engage in peer-to-peer learning opportunities at established schools.

For instance, Big Picture Learning and New Tech Network have teachers new to the network visit established schools to see their counterparts implement pedagogical practices unique to the network. They visit advisories, observing how host teachers build relationships with students to foster inclusive classroom communities, and examine how staff support students in independent, interdisciplinary deeper learning. Visiting teachers also converse with host teachers to learn about effective project management and to find solutions to other instructional challenges they encounter implementing the network's model. To illustrate, a special education teacher at a Big Picture Learning school stated that she struggled with Big Picture Learning's "unschoolified" learning approach, particularly around writing an Individualized Education Plan (IEP) that aligned with the network's pedagogical approach and how to teach students with special needs within an advisory setting. The teacher commented that it was helpful to see how days are structured and to connect with her counterpart at the Big Picture Learning site in her state to envision how she could approach her work.

While Big Picture Learning does this throughout the year, New Tech Network has identified strategic points in the planning and development process when educators should visit established network schools. These points include executive tours and the teacher and leadership residencies. According to New Tech Network leaders, this practice helps educators imagine what the model could look like for their own students. (See "New Tech Network Teacher Residency.") These exchanges also introduce teachers and leaders to the foundational features and dispositions that are necessary to enact high-quality project-based learning. One instructional specialist at a South Carolina New Tech Network school described the power of these professional learning experiences: "It provides a very intense, deep experience in a PBL [project-based learning] school that gets you to shift how you think about teaching and learning."

Internationals also utilizes the power of visitations to enhance professional learning. For instance, in addition to hosting the network gatherings at established schools, Internationals has a committee, which includes teachers from different schools who gather to visit established Internationals schools so that teachers can learn and improve their practice around the performance assessment portfolio process.

Each of the three networks also encourages observations of deeper learning within schools to facilitate peer-to-peer learning. For example, at Internationals schools, teachers continually work with one another to improve instruction through classroom observations. Because of the network's open-door policy, it is a norm that teachers frequently visit each other's classrooms to provide feedback or to learn new techniques. Educators with New Tech Network and Big Picture Learning also indicated that they had observed their more experienced peers as a way to learn deeper learning techniques that could improve their practice and implementation of the network model.

Each of the three networks also encourages observations of deeper learning within schools to facilitate peer-to-peer learning.

Overall, Big Picture Learning, Internationals, and New Tech Network have structures and processes for educators to see deeper learning instructional practices in action. Through professional learning opportunities, such as intra-network visits and classroom observations, the networks provide teachers with supports that help them deepen their understanding of the network models and continuously improve their practice.

New Tech Network Teacher Residency

After a 5-hour road trip from their home district in Virginia, six teachers and their school principal meet at a New Tech Network high school in South Carolina to begin their 2-day Teacher Residency. Heather Hester, a New Tech Network School and Leadership Support team coach who is assigned to this developing school team, greets the team with a welcoming smile and a bag of miniature candy bars. As these educators sit together at a long table covered in Post-it Note pads and colored markers, Heather shares basic information about New Tech Network, including its mission and vision, and how it defines the New Tech Learning Outcomes. As she continues sharing information with this school team, she shares that she was a teacher at a New Tech Network school in Indiana during the earlier years of New Tech Network. She describes to the group that her first year teaching at a New Tech school was the hardest year of her teaching career. It is clear that she understands the challenges of taking on a new instructional approach, as well as the reward of seeing all students thrive in an educational setting.

The new New Tech Network school team soon learns their goal for the Teacher Residency: to develop their graduate profile. Heather facilitates the Teacher Residency using the same project sequence that teachers use in their classrooms with their students. This begins, of course, with an entry document. Each adult in the room opens a New Tech Network branded folder on his or her desk to find a letter, from Heather, welcoming the adult to the network and outlining his or her task: “to develop a presentation describing the qualities of their ideal graduate.” While only spanning the 48 hours of the Teacher Residency, this is designed to mimic almost exactly what students experience, as a way to help these teachers put themselves in the shoes of their future students.

The group begins by identifying what they already know about their hypothetical ideal graduate, what they need to know, and what their next steps are. The group identified, for example, that they need to know how to connect state standards to New Tech Learning Outcomes, and Heather writes this on poster paper to form a list of what the group needs to know. This poster remains on the wall through the entirety of the residency and is revisited and edited as the group learns more or as they have more questions.

As the group experiences this process, Heather also points out why it is an important part of the project sequence, describing it as an opportunity for teachers to get a sense of what their students are picking up on from the entry document and what they should plan to revisit. She also points out what about this process is similar to what students will do and how it will be different (since the Teacher Residency is on a shorter time frame). In the Teacher Residency, for example, this group processes what they know and need to know as a group, while students in a classroom would read an entry document by themselves, do a small-group processing of what they know and need to know, and then participate in a whole-group share-out that is compiled into “knows” and “need to knows” for the entire class.

For the majority of the Teacher Residency, the school team is participating in activities, facilitated by Heather, that are intended to develop their knowledge of how to operationalize the New Tech Learning Outcomes and put into practice processes and structures that will facilitate the development of those skills in their students. Because the Teacher Residency is happening at an existing New Tech Network school, the team also has the opportunity to learn from New Tech Network teachers and New Tech Network students. Each team member was able to explore the New Tech Network school with a student guide and ask questions about life as a New Tech Network student. After the first day, the educators are tasked with a homework assignment: to collaboratively develop a set of decision-making protocols. The following day, they will be expected to put those protocols into action as they make decisions together about a list of qualities for their ideal graduate.

At the end of the New Tech Network Teacher Residency, the team of educators is ready to present their ideal graduate, the project the team has worked to develop over the 2-day period. In a classroom, with a few New Tech Network students and New Tech Network teachers as the audience, the new school team creates a mock graduation as their presentation. One of the Teacher Residency participants stands in the center of the room, wearing a graduation cap made from construction paper. His fellow team members begin reading out the skills and competencies they have chosen to include in their graduate profile and walk across the “stage” to stick a Post-it Note with each skill or competency on him, making both students and teachers in the room laugh in the process.

With this presentation, the team completes the goals of their project, which were to share what they expect all their students to be able to do when they leave their school and to develop protocols for decision-making and collaboration that they can use with their staff. At the end of the presentation, the audience of New Tech Network students and teachers provide some feedback to the team and suggest next steps that the group can use as they continue revising their ideal graduate before the first day of school. As one of the teachers described in the post-presentation debrief with Heather, the residency helped make the New Tech Learning Outcomes, particularly the concept of student agency, much less abstract.

Improving instruction through coaching

Big Picture Learning, Internationals, and New Tech Network each create structures and processes for educators to learn with and from each other, but the three networks also support teacher learning through direct coaching. Coaches are network employees that work with a designated number of schools or teachers and facilitate targeted and ongoing professional development to teachers and leaders at network schools throughout the year.¹⁰⁴

Coaches in each network play a pivotal role in teacher professional development and provide ongoing support to network schools. At New Tech Network, for example, coaches work closely with schools for the year leading up to their first day as a New Tech Network school and for the first year of operation. These coaches are resources for project-based learning knowledge and develop an intimate understanding of each school and district so they can help teachers and school leaders anticipate and overcome challenges. During this time, they also focus attention on professional development for the school’s instructional coach (who is generally an administrator or teacher leader) so that the network coach can phase out direct support over time and the school-based coach can take responsibility for teacher professional development and support. Even though this direct support phases out, network coaches maintain relationships with the schools they have worked with and serve as ongoing resources as needed.

At Big Picture Learning, school design coaches lead school-year kickoffs at each site that typically center on shifting or establishing culture and generally provide between 10 and 20 days of targeted professional development over the course of a given year, depending on the needs of the individual school. Coach-led professional development throughout the year aims to build the school’s capacity to sustain the model. For example, Big Picture Learning coaches might gather teachers and school leaders to further their understanding of Big Picture’s learning cycle, including deep dives into interest-driven project development, performance assessment, or the development of productive advisories. While professional development aims are often predetermined, these learning sessions

can be free-flowing conversations that center on teacher and leader needs. In addition to collective learning experiences, Big Picture Learning coaches also described meeting teachers and leaders one-on-one to provide individualized support during these gatherings.

Internationals teachers also work with knowledgeable coaches to effectively implement the network's approach. For example, teachers often receive coaching from Internationals coaches, who provided targeted support to personnel at school sites. At some schools, new teachers are paired with in-house mentors who are seasoned teachers and often members of their interdisciplinary teaching team. While the engagement is not overly structured, the mentors provide relevant and timely feedback through meetings and classroom observations on deeper learning and integrated language instruction and gradually reduce their support over a 2-year period. An Internationals teacher described how she worked with her mentor during her first year with the network:

When I first started at this school, I developed lessons that resembled a college environment ... lessons that were not feasible for Internationals students who are at different learning levels and with different abilities. So those first 2 weeks of school were a shock. Then there were 2 weeks where I had my coach with me at all times. She would come to observe me three times a week, and then we'd meet twice to discuss the observations. We'd talk about what could be done to improve the lessons—how to deliver them better, how to scaffold the activities, how to think about if this is what we want them to know. Then we'd talk about how to do this for three different types of learners: somebody with no previous academic education, somebody with no previous English ability, and somebody at the higher level. This experience with my coach gave me a lot of support.

Beyond this mentoring structure, Internationals emphasizes the importance of coaching as an essential support for all teachers, and as such, even seasoned teachers maintain coaching relationships with other teachers that help support their practice.

Despite differences in providing these job-embedded supports, each network utilizes coaching as a strategy for reinforcing the network model in schools and providing initial and ongoing supports for teachers. Network coaches play a critical role in providing direct support to teachers and in helping schools develop a strong culture and deeper learning practices aligned with each network's vision.

Providing access to teaching and learning resources

Each network also provides teachers with access to resources through virtual and, often, on-demand platforms. To do this, Big Picture Learning, Internationals, and New Tech Network have developed proprietary learning management systems to house resources and connect educators across the network.

Educators in Big Picture Learning schools, for example, have access to two systems to support their professional learning: Learning Big Picture and ImBlaze. In 2017, Big Picture Learning launched Learning Big Picture as an online platform that houses over 20 years of effective practices for student-centered learning. The platform began with an introductory course for educators new to the network, which consisted of modules that focused on the basics of advisories and understanding adolescent mindsets. Now, Learning Big Picture serves as an exchange of information between the network and its teachers by promoting intra-network collaboration through the sharing of videos,

classroom resources, and research from the field. Big Picture Learning's other platform, ImBlaze, was developed in response to ongoing challenges teachers had in identifying, securing, and tracking student internships. It now supports Big Picture Learning staff in managing student internships and gives schools the ability to curate a dataset of potential internship sites. Students also have access to ImBlaze, through which they can search for internships by interest, record their attendance, and keep a journal to share their workplace learning.

Similar to the Learning Big Picture system, Internationals provides educators with access to curriculum resources online through its platform, ISHARE. ISHARE contains over 850 exemplary curriculum units and videos that can provide teachers with ideas and tools for use or adaptation in their own classrooms. The platform also allows teachers to contribute their own resources (e.g., projects and web links) and to collaborate with others across the network, thus fostering a broader community of practice.

New Tech Network's learning management system, Echo, is also similar to both Learning Big Picture and ISHARE. While Echo is used in classrooms across the network as a tool to track student progress, it also provides teachers with access to vetted project exemplars, assessment banks, and resources from their fellow educators. Documents and resources that teachers use to support project planning and project rollout are also housed on Echo. In addition to resources shared through its Echo system, New Tech Network also offers virtual workshops that seek to provide educators with skills they can use in their schools and classrooms. These learning opportunities are offered monthly and are facilitated by New Tech Network staff members across the country. Teachers and leaders are free to attend any of these workshops, which span a wide range of topics, such as *Building Leaders in Your Building*, *Integrating the Learning Outcomes Into Scaffolding*, and *Project Rollout—Launching a Project*.

Overall, the virtual resources provided by Big Picture Learning, Internationals, and New Tech Network are intended to help educators answer questions they may have, overcome challenges they might experience in their day-to-day work, and support their ongoing development of skills associated with each network's deeper learning approach.

Making professional learning experiential

Consistent with research on effective professional learning, the networks have found that their teachers learn best when they learn through the same pedagogical structures that they will be implementing in schools.¹⁰⁵ To this end, all three networks often structure capacity-building activities in ways that mirror the deeper learning in their networks, helping teachers to see high-quality models of network practices in action and experience those practices from both the perspective of the student and the teacher.

The networks have found that their teachers learn best when they learn through the same pedagogical structures that they will be implementing in schools.

At Big Picture Learning, teachers engage in an array of experiential learning opportunities that parallel Big Picture Learning practices. For example, at each of the network’s annual or semiannual conferences, educators are assigned to an advisory that regularly convenes to discuss emerging insights and takeaways. During advisories, facilitators demonstrate facilitation techniques and signature network culture-building activities that Big Picture Learning educators are encouraged to transplant into their practice to build inclusive and supportive advisories. Whole-school professional development at school sites operates similarly, allowing the advisory culture to permeate teacher learning. In addition to experiencing advisories, coach-led onboarding efforts at school sites typically include the development of advisor learning plans, which follow the same format as the ones for students, and an introduction to Big Picture Learning’s learning cycle. With the latter, network coaches described how they engaged teachers in condensed learning cycles to understand its various phases. One former coach explained:

I ask staff, “What’s something you’re interested in? Now let’s have you try to find someone in the area who does that and reach out to them and contact them and either interview them right there during PD or maybe as a Leaving to Learn thing.” Then they come back and share that learning with colleagues to model what we’re trying to have students do.

Similarly, New Tech Network takes as many opportunities as possible to engage educators in project-based learning during professional development. For example, during the school development process, educators experience the same structures students use when completing their projects to design their schools with colleagues and network coaches at teacher and leadership residencies. (See New Tech Network Teacher Residency for a detailed example from a Teacher Residency.)

Virtual learning opportunities for New Tech Network teachers and leaders follow the same practice. To illustrate, during a virtual learning session for teachers on how to roll out a project, teachers were presented an entry document—an artifact that is often used in project-based learning to spur student curiosity and interest in a particular topic—and were asked to develop a related driving question and problem statement that would guide student inquiry. Throughout the session, the network coach facilitating the workshop drew connections to how the challenges they were facing in generating substantive problem statements were the exact challenges students would face when engaging in their own projects.

Like the other two networks, Internationals structures professional learning opportunities in ways that mirror the network’s instructional strategies. Yet the network takes it a step further to ensure that professional learning also captures the academic, social, and emotional challenges and opportunities that English learners experience in classrooms. For example, at its summer and fall conferences, Internationals engages educators in an introductory activity that immerses teachers in a classroom taught in a foreign language. This session allows educators to experience the challenges of being a language learner and exposes them to an array of techniques used in Internationals classrooms to illustrate the power of the network’s approach. (See “Learning in a Foreign Language” for a detailed description of this professional learning experience.) Other Internationals professional development workshops are delivered in similar ways. For instance, workshops on science instruction and literacy development for students who speak native languages that do not have written forms are facilitated by Internationals educators in a format that mirrors the student-centered, active learning.

Learning in a Foreign Language: A Seminal Experience for Internationals Educators

A pivotal rite of passage for every Internationals educator occurs at the summer and fall professional development conferences, where they attend a workshop centered on an essential question: “How do we help our students with limited English proficiency to access rigorous content, skills, and academic language?”

To explore this question at the fall 2017 conference, teachers imagined themselves to be an adolescent leaving the United States for Germany with no German language proficiency. Attendees of the workshop were presented with a lesson taught entirely in German, with no scaffolding, so they could grapple with the challenges of learning in a foreign language and develop empathy for how English learners may feel in classrooms.

After the initial German classroom simulation, the workshop attendees then experienced the same lesson through the Internationals approach to teaching English learners. Still taught solely in German, the facilitator used a variety of scaffolds and active participation to engage teachers in a lesson in which they learned substantive content despite their unfamiliarity with the language in which the workshop was being conducted.

To begin, the teacher facilitator greeted a participant teacher by pointing to himself and saying his name, “Ich heisse Herr Muller.” He repeated this two more times and then pointed to the participant teacher, waiting for her response. She understood that he was asking for her to state her name, and she said, “Leslie.” He shook her hand and began the class.

This time, the teacher began by teaching the class the word “wall” by saying it (“die Mauer”) and providing visuals of the word and pictures of walls. He also passed out worksheets that included helpful words in German and English to give more understanding and context to a lesson on the Berlin Wall. The German words for “war,” “conflict,” “military,” “protest,” and others were also provided. Eventually, the teacher had students work through materials in German, with text, visuals, photos, maps, and timelines summarizing the events leading up to the fall of the Berlin Wall. The class was broken into several groups of four, and each group was given time to engage with the content using the vocabulary they had learned, Google Translate, their own background knowledge, and their problem-solving skills. While educators were learning and using their new language (in this case German), they were drawing heavily on their home languages and their background knowledge. Overall, this professional learning approach engaged new teachers and provided ample scaffolds for them to learn new content, even in the midst of an unfamiliar language.¹⁰⁶

After the exercise, the session attendees had the opportunity to reflect on the experience of the two different lessons and to look closely at the techniques the teacher facilitator used that were effective.

Informal conversations with new teachers suggest that this workshop was a useful introduction to the Internationals approach, as they experienced learning through the eyes of their students. They expressed that it gave them confidence that the Internationals approach can work, enabling all students to overcome the challenges of learning a new language in congress with rigorous content through the use of strong differentiation techniques.

Overall, by engaging educators in these learning experiences, the networks provide teachers who have varying levels of exposure to deeper learning pedagogies with opportunities that allow them to understand these instructional practices, the demands they place on students, and their impacts. By infusing experiential learning in their various professional development forums, the networks reinforce their pedagogical models at each turn and provide educators with reinforcing opportunities to continuously improve their practice in collaborative ways. Through these multifaceted structures and processes for professional learning, Big Picture Learning, Internationals, and New Tech Network aim to support the instantiation of deeper learning across their schools and cultivate a teacher workforce knowledgeable of and committed to deeper learning.

4. Developing Deeper Learning Leaders

The three networks implement reinforcing professional learning supports so that educators can effectively implement deeper learning and develop the necessary mindsets and attributes that will allow their models to persist. As they actively support teacher learning across their networks, Big Picture Learning, Internationals, and New Tech Network also deeply invest in school leaders. School leaders in deeper learning networks must be instructional leaders who are knowledgeable about deeper learning and must think structurally so as to design schools in which these models can be initiated and sustained. Furthermore, site leaders must be relationship builders—working with parents, communities, and host districts to support student learning and their presence in their respective locations.

The networks recognize the vital role of school leadership for both equity and deeper learning. As such, each network provides leaders, including principals, teacher leaders, and other administrators, with professional development opportunities that prepare them to establish and sustain network schools. In this process, the networks also create leadership pipelines that allow “network DNA” to be transferred to their various locations and new sites.

Preparing school leaders

Before network schools open, school and district leaders must be oriented to the systems and structures that best support students’ deeper learning. To do this, Big Picture Learning, Internationals, and New Tech Network spend time working with principals and other key stakeholders to build their capacities to support teachers and schools. While the onboarding time period differs by network and site location, the activities leaders typically engage in include intra-network visitations, new principal convenings, and coaching sessions with network staff.

New Tech Network school and district leaders are often involved from the moment a district seeks to establish a New Tech Network school. The network maintains a very structured process to build the capacity and knowledge of its leaders, which includes shared learning experiences and direct coaching. After working to develop a school vision aligned with the network’s outcomes and project-based learning model, leaders participate in a 4-day Leadership Residency to immerse leaders in a New Tech Network environment. The residency, which takes place at an established New Tech Network school, provides general information about the network’s project-based learning model and the teacher and leader mindsets and practices that support its deeper learning approach.

The network continues to work with school leaders throughout the planning phase to attend to leaders' unique needs and questions. This process also involves these leaders in shared learning experiences alongside teachers when possible.

The processes Big Picture Learning uses to onboard principals is similar to New Tech Network's, as both networks seek to involve school leaders and their staff in vision-setting and school design. Specifically, Big Picture Learning asks new principals to participate in individual and collaborative trainings with network staff and to visit established, high-fidelity Big Picture Learning schools to see best practices during "The Year Before Opening" (TYBO). In addition to hosting site visits, the network hosts in-person and virtual meetings for new leaders during TYBO in which their assigned Big Picture Learning coach facilitates professional development on topics such as building a strong school culture, developing relationships with local stakeholders, and understanding operational management.

The formal training and targeted school design support strategies used by Big Picture Learning and New Tech Network are also used by Internationals. Yet Internationals encourages leaders that are new to the network to spend more time in established Internationals schools. New principals may participate in an immersive (i.e., multiple weeks to months) apprenticeship with an Internationals principal at an existing network school or conduct a series of structured site visits to learn from experienced leaders and to see the model in action. During an apprenticeship, new principals shadow their mentors, studying how to effectively lead an Internationals school, and spend time developing plans for opening their new schools. As the new school nears opening, the network also provides an experienced coach to support the new principal with the school launch.

Overall, these onboarding supports are intended to prepare leaders new to the network to design school environments that can support deeper learning in their local settings. By supporting the design phase, observing network models firsthand, and collaborating with experienced staff, leaders develop an understanding of the needs and goals of their schools and laying the groundwork for their schools' systems, structures, and cultures.

Ongoing support for school leaders

Beyond these onboarding experiences, networks engage leaders in ongoing professional development opportunities to support continuous learning.

For example, each network gathers leaders, much like they do teachers, for in-person professional learning. At Big Picture Learning, most school leaders can attend an annual leadership conference each December that convenes network, site, and system leaders. At the gathering, leaders attend workshops or "deep dives" on topics such as student recruitment, communication strategies, and deeper learning instruction, among others. They also share best practices that can be adapted at their home sites, and they participate in excursions, called "Leaving to Learn," to affiliated sites or student internships.

Similarly, New Tech Network holds leadership summits, which are in-person opportunities that allow their site leaders to grow their professional networks and to continue improving their practice. The 3-day summit in spring 2018, for example, focused on giving leaders tools

to analyze their practice so as to create a learning organization with a culture of continuous improvement that will build their capacities to adapt and evolve their project-based learning practices. New Tech Network also has leadership-specific learning activities for its school leaders at the New Tech Annual Conference, where leaders can practice using protocols that they can adapt for their own staff meetings. Internationals school leaders also participate in a separate network-wide annual forum that focuses exclusively on leadership development. In this forum, school leaders identify lines of inquiry they hope to explore and collaborate with other leaders from across the network throughout the year to address their questions and challenges.

The three networks also ensure that leaders receive ongoing support. Access to coaches, or network staff charged with providing sites with professional development, is one mechanism by which all three networks provide leaders with personalized support. For instance, New Tech Network coaches are readily accessible to leaders via phone or email to address their emerging needs, and coaches meet with school administrators during their site visits to discuss successes and challenges. Coaches at Big Picture Learning and Internationals provide similar support to ensure that leaders are supported in meeting their immediate and long-term professional and school needs. In all the networks, coaching is targeted to the specific needs of each school leader and his or her school. This coaching may focus, for example, on instruction, supporting new teachers, addressing family needs, or building external partnerships. In each network, access to coaches is gradually decreased as leaders become more confident, knowledgeable, and fluent in implementing and managing deeper learning schools.

In addition to professional coaching, some networks facilitate opportunities for leaders to develop informal communities of practice. For example, network leaders and coaches at Big Picture Learning intermittently gather regional cohorts of school principals to engage in collaborative learning. These informal convenings, which can occur in person or virtually, allow Big Picture Learning leaders to collectively grapple with problems of practice as they emerge, which helps to counteract what one Big Picture Learning staff member described as the fleeting insights leaders gain at infrequent conferences and coach-led discussions.

Overall, these supports reinforce network models while also helping school leaders further develop their abilities to identify needs and adjust their practices to better support teachers and students.

Leadership pipelines

As networks build teacher and leader capacity, they also develop teacher leaders and grow their own leadership pipelines. Though each network does this in distinct ways, the purpose remains the same: to build expertise in deeper learning pedagogies and to spread those practices to more classrooms and schools.

For example, Internationals frequently advocates having its successful teachers and leaders design and lead new sites. Tapping experienced staff to lead new schools allows the network to transplant its DNA into new settings while allowing leaders to adapt the model to local conditions. In most cases, the network has also sought to support new leaders by suggesting that experienced Internationals educators from other sites or teachers with ample experience with English learners be brought on as teacher leaders.

Big Picture Learning does this in a similar way—by promoting successful teachers to administrative positions after they have demonstrated a deep understanding of the network’s complex workplace learning model. The network also taps its successful school leaders to serve as Big Picture Learning coaches or regional directors—organizational roles that are instrumental in the dissemination of the network’s approach. Because of their experience in implementing the model on the ground floor, these successful educators bring deep expertise and often draw upon this experience to inform site-based decision-making.

New Tech Network also taps network educators to become coaches in a way that is similar to Big Picture Learning. For example, many teachers within New Tech Network become certified project-based learning trainers or coaches within their schools or districts or, in some cases, have been hired by the network to be a team coach for District and School Development or School and Leadership Support. To develop this leadership expertise among New Tech Network teachers, the network offers project-based learning certification, coach certification, and train-the-trainer programs. These programs, which are a combination of both in-person and virtual professional development, help teachers build their capacities to facilitate adult learning around project-based learning. After being certified, teachers are able to use these coaching skills in combination with the experience they have gained in New Tech Network classrooms to help other teachers and schools. These programs are a particularly useful structure as New Tech Network re-creates schools across the country because it provides opportunities for more educators to become experts in project-based learning and creates a group of educators and coaches who can spread New Tech Network practices, meaning New Tech Network is not the only entity that can facilitate change in a school or district.

Overall, Big Picture Learning, Internationals, and New Tech Network understand the critical role leaders play in the development and sustainability of deeper learning schools. In turn, the networks have invested in leadership development. They support leaders in school design and facilitate professional development opportunities before these leaders assume administrative duties, and they provide a range of ongoing supports to enable leaders to address emerging challenges. They also create pipelines that allow successful educators to develop their leadership skills to support the implementation and spread of deeper learning. With these leadership development structures, the networks create opportunities for leaders and educators of all levels to learn and grow, signaling the importance of continuous learning for the entire school community.

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5. Maintaining a Learning Orientation for Continuous Improvement

While Big Picture Learning, Internationals, and New Tech Network have leveraged professional learning structures and partnerships to instantiate and sustain their schools, this process has not been without challenges. As the networks have worked to reimagine the “grammar of schooling”¹⁰⁷ through their deeper learning-based approaches, they have faced external and internal obstacles that have affected their abilities to re-create their schools in high-quality ways.

To overcome these challenges, the networks have maintained a learning orientation and adapted their approaches to growth, school design, and professional development to spread deeper learning to diverse communities. In addition, network staff have engaged in their own learning to discuss innovations and best practices that advance deeper learning and equity. With this focus on organizational learning, Big Picture Learning, Internationals, and New Tech Network have refined many of their systems and practices, allowing the networks to evolve and improve their approaches to re-creating schools and supporting deeper learning.

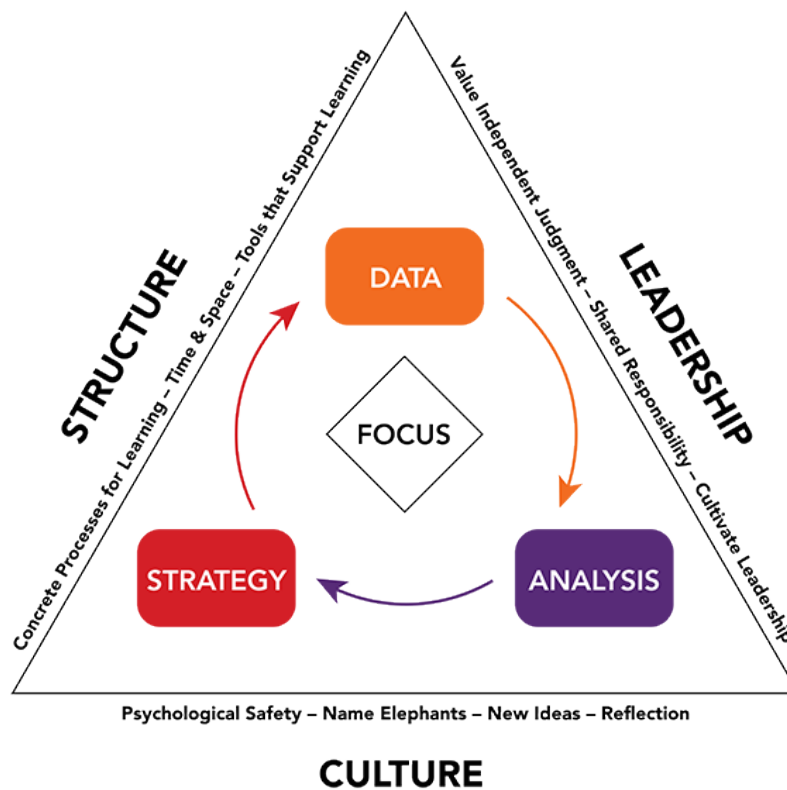
Evolving approaches to support growth

In reflecting on their practices, the networks have assessed how they support network growth, leading two of the three networks to adjust their approaches to improve impact and quality. At New Tech Network, for instance, this habitual reflection is embodied in the network’s Learning Organization Framework, a tool the organization has developed through its involvement in continuous improvement science. (See Figure 9.) This framework is based on the premise that any meaningful effort for change starts with a clear focus on something specific. That goal becomes the focus of the change effort and is at the center of the cycle of inquiry that includes data, analysis, and strategy. New Tech Network uses this framework to improve its support to schools and encourages schools to embrace the framework as well.

Using this cycle of inquiry has caused the network to reassess its approach to supporting local leaders in developing New Tech Network schools. While the network still encourages schools to adopt its whole model, it has started to offer differentiated services to adapt to school constraints and opportunities.¹⁰⁸ Dr. Megan Pacheco, the Chief Learning Officer at New Tech Network, explained: “Some low-capacity schools may need just a slice of the package so that they focus on the right things first.” This new approach may allow eventual partner schools to ramp up their capacities more slowly and intentionally. At the same time, it could risk diluting the model and reducing its capacity to be effective, something the network leaders are watching and will reflect upon.

This reflection process has also led New Tech Network to re-evaluate its stages of implementation, particularly for schools whose contracts are expiring but still wish to implement the project-based learning model. Because the network observed that these schools had difficulty sustaining the model after their formal partnership ended, New Tech Network has developed a series of supports that “post-implementation” schools can opt to receive to support ongoing quality implementation.

Figure 9
New Tech Network’s Learning Organization Framework



Source: New Tech Network. (2016). The learning organization framework. <https://newtechnetwork.org/resources/learning-organization-framework/> (accessed 04/23/19).

Big Picture Learning, too, maintains a continuous learning and improvement mindset, which has led to adjustments in its approach to growth and spread in different communities. While the network generally aimed to grow the number of schools utilizing all 10 distinguishers in the early days of its expansion, network staff realized that administrative and accountability pressures associated with launching new schools were leading some site leaders to implement more conventional school structures, which undermined the Big Picture Learning approach. These growing pains caused the organization to rethink its approach to expansion. Now, rather than only replicating the comprehensive school design, Big Picture Learning affiliates have the option of adopting a set of distinguishers, especially the network’s high-leverage distinguishers, such as advisories, internships, personalized learning, and authentic assessment, to re-create the network’s approach in ways that are responsive to local constraints and opportunities.

In addition, Big Picture Learning has restructured its staff to support the spread of deeper learning. As the organization experienced a rapid period of expansion, many of its senior leaders were wearing multiple hats—guiding site selection processes, providing coaching to network sites, and sharing deeper learning practices in professional learning communities. To alleviate the strains on staff capacity, Big Picture Learning grew its programmatic staff and created specialized positions that focus on supporting professional learning among network-affiliated

practitioners or the re-creation and sustainability of sites in given regions. In demarcating the roles and responsibilities, Big Picture Learning is better able to manage site selection and model implementation that is both community responsive and high quality.

Adapting school designs to enhance deeper learning

The networks have also taken strides to address challenges in their school designs, which have at times undermined deeper learning at their sites. Some additions and adjustments to school designs have included increased access to staff, curricula, and social and emotional supports so that student needs are holistically addressed.

For example, at Big Picture Learning, network and site leaders recognized that practitioners were having difficulty in supporting students in investigating the mathematical or quantitative dimensions of their interests—a challenge that had been exacerbated by the fact that Big Picture Learning teachers often hold credentials and content expertise in specific areas of study. To address these issues, several Big Picture Learning–affiliated schools have hired math specialists to help students build their quantitative reasoning in dedicated math classes and/or to work collaboratively with teachers to incorporate math content and quantitative reasoning into student projects.

Internationals has also iterated on its school design structures to improve instruction and student engagement among its English learners. While students in Internationals schools have always come from a range of backgrounds and experiences, network-affiliated schools have recently seen an increase in the number of unaccompanied minors attending their schools. Newer Internationals schools first saw this shift and adapted their structures to meet the needs of these students by increasing flexibility in formal school hours to accommodate students' work obligations and by supporting students in securing stable housing. Network leaders recognized this trend and shared this learning across the network's schools. As a result, several established Internationals schools have incorporated similar structures into their school designs to support students holistically in their learning and well-being.

Improving professional learning for a growing workforce

As the networks have grown, they have also had to improve and diversify their professional learning supports to meet the demands of their workforces and to provide more immediate support to practitioners. For instance, Big Picture Learning developed ImBlaze, its internship management software, and Learning Big Picture, a virtual platform with professional and curricular resources, to provide educators with immediate access to project tools and resources that could help them implement the network's deeper learning model. The network's regional convenings, which gather smaller cohorts of teachers throughout the year, also emerged to provide a way for teachers and leaders to develop a community of learners. Recognizing that insights gained at intermittent conferences or coach-led sessions could be fleeting, Big Picture Learning staff believed that regional convenings could provide much-needed, ongoing professional development to network sites. Regional convenings, they reasoned, could increase the frequency and continuity of professional learning, which could improve deeper learning quality and the relationships at Big Picture Learning schools.

Internationals provides another example of how professional learning has evolved to meet teaching and learning demands at its schools. Over Internationals' history, its leaders have gained insight into the recently arrived immigrant experience and the challenges that it presents for educators and students alike. They recognized that not only were there academic challenges that came with

instructing English learners with varied language and educational needs; there were also social and emotional needs that emerged as a result of the immigration experience. With the network's growing understanding of its students' holistic needs, the network has increasingly incorporated workshops and learning opportunities on trauma-informed teaching and social-emotional learning practices into its professional learning structure.

Learning with peers to improve deeper learning and equity

Another way that the networks adapt, improve, and grow their practices to ensure that students have high-quality and equitable learning experiences is by availing themselves of opportunities to learn in collaboration with innovative peer organizations to exchange ideas and to address mutual challenges. These learning opportunities happen formally as networks participate in national convenings of deeper learning experts (e.g., Hewlett Foundation's Deeper Learning Network and High Tech High's Deeper Learning Conference). Network engagement in deeper learning communities also occurs at the state and local levels. For example, Internationals is an active participant in field consortia, including the New York Performance Standards Consortium (NYPSC) and the California Performance Assessment Collaborative, which seek to advance and improve the use of performance assessments across schools and districts. Participation in these forums has also allowed Internationals to refine and strengthen its portfolio system through regular calibration exercises of student work with other NYPSC schools.

The networks have also created forums that bring network and education leaders together to have critical exchanges. For instance, Big Picture Learning and Internationals partnered to found and launch the Deeper Learning Equity Fellowship in 2015. The fellowship, which selects and engages cohorts of 10 to 20 mid-career leaders in a given year, aims to provide fellows with tools to expand deeper learning leadership in public schools through "face-to-face and online dialogue, school visits, conversations with prominent senior education leaders, and independent or partnered Fellow capstone projects."¹⁰⁹ The fellowship also emphasizes the equity dimensions of deeper learning and seeks to "amplify voices and perspectives underrepresented in the deeper learning movement."¹¹⁰ To date, the fellowship has convened three cohorts of leaders and created cross-sector collaborative learning experiences that build knowledge and support for deeper learning and its ability to advance equity.

Another example is Big Picture Learning's Puget Sound Consortium for School Innovation in its Northwest region. Under the leadership of one Big Picture Learning Regional Director, Jeff Petty, the Consortium works with school leaders to develop or transform schools so that students engage in real-world, interest-driven learning. It also offers professional development on deeper learning and operates a yearlong leadership incubator called School Foundry that brings together principals "to encourage new breakthrough school designs and immerse principal candidates in the Consortium's growing regional network of non-traditional schools and school leaders."¹¹¹ While the Consortium is led by Big Picture Learning staff, the varied Consortium participants allows for the exchange of ideas among innovative-minded practitioners.

Taken collectively, network leaders actively engage and facilitate communities of practice that allow them to hone their deeper learning models. When coupled with their internal reflection and iteration practices, Big Picture Learning, Internationals, and New Tech Network have been able to adapt their approaches in ways that improve their school designs, professional learning practices, and abilities to spread deeper learning.

Findings and Conclusions

For many, the task of taking promising pedagogical approaches to scale has been viewed as a technical challenge—one focused on expanding the number of classrooms implementing an approach or providing teachers with the necessary instructional tools. Yet a technical focus overlooks the multiple dimensions of change that often inhibit implementation and sustainability.¹¹²

Big Picture Learning, Internationals Network for Public Schools, and New Tech Network have used approaches and structures that attend to these different change dimensions. In turn, they have effectively re-created their models to support students furthest from opportunity across the country and provided important lessons on how to face and overcome the challenges that accompany making fundamental changes to teaching and learning in public schools. We found that, to manage complex change process successfully, the networks deeply planted deeper learning in local settings and built expertise among their educators and leaders to support their sustainability.

1. Each of the networks uses its deeper learning and equity visions to guide all aspects of school design and model implementation.

None of the networks is driven by annually increasing the number of schools in its network. Rather, they are driven by their commitments to deeper learning and to spreading practices, norms, and beliefs grounded in equity.

With these commitments, Big Picture Learning, Internationals, and New Tech Network intentionally design schools for deeper learning and rethink the structures surrounding teachers' work, the use of time in schools, and the ways in which students demonstrate their progress. These school design features, often discussed as prerequisites for entering local partnerships with districts, include creating schools that allow for interdisciplinary learning, teacher looping, and flexible schedules so that there is ample time for teachers and students to engage in collaborative and applied learning. In addition, networks work to find ways that allow students to earn credits as they engage in real-world tasks and performance assessments. To build schools with these structures, the networks actively seek to secure policies and conditions that enable their models to take hold.

Networks also secure structures that attend to students' social, emotional, and academic needs—systems that provide the foundation for meaningful learning and productive academic struggle. By creating schools that allow for advisories and the provision of services to meet students' diverse needs, Big Picture Learning, Internationals, and New Tech Network design schools that surround students with the systems of support that can enable their learning and well-being.

2. The networks collaborate with local stakeholders to ensure their models are responsive to local communities.

While Big Picture Learning, Internationals, and New Tech Network advocate for the conditions that allow their models to flourish in districts, they do not establish or sustain their schools in a unilateral manner. Instead, each of the networks continuously collaborates with a wide range of local stakeholders to instantiate its model, working to ensure that its schools are responsive to local needs and communities.

The networks formally and informally work with districts, site-based educators, and community members as they establish sites to ensure their models are a good fit for student and district needs and that their models are welcomed rather than imposed. Once established, network and school leaders continue to build relationships with district, community, and external partners to build community investment in the model and to extend the school's capacity to support students in deeper learning.

3. The networks build and maintain systems of professional learning that ensure that teachers and school leaders are continuously supported in enacting deeper learning.

Because many teachers are underprepared to implement deeper learning, Big Picture Learning, Internationals, and New Tech Network have built systems of professional learning that create opportunities for practitioners to learn and experience deeper learning in ways that build and reinforce their knowledge.

To this end, each of the networks implements network-wide gatherings to introduce teachers to the foundational features of its approach. The networks also facilitate intra-network visitations in which teachers not only can learn how to enact the network model but also can see the power and potential of these approaches firsthand. Notably, teachers typically engage in these professional learning experiences in ways that mirror how students learn in the networks, strengthening their understanding of deeper learning and the student experience.

Big Picture Learning, Internationals, and New Tech Network also provide their teachers with ongoing supports, including access to expert coaches who address pressing issues as they emerge in the implementation of deeper learning pedagogies and to resource repositories that include curriculum and assessment models.

Coaching for both leaders and teachers is carefully scaffolded so that intense support from the network is gradually reduced as in-school coaches are developed and take on increasing responsibility over time, leaving the school with a strong internal capacity for the work.

Overall, these professional learning opportunities coalesce to provide educators with a reinforcing set of experiences that develop the skills needed to enact deeper learning and enable them to see the power and possibilities of these approaches.

4. The networks develop deeper learning leaders.

The networks have also developed and maintained systems that support leaders in designing and sustaining deeper learning, which has helped them to instantiate and grow their models in high-quality ways. Big Picture Learning, Internationals, and New Tech Network each invest in leadership development before a principal assumes the helm of a network school—engaging new site leaders in targeted professional development, intra-network visitations, and coaching sessions. The networks also engage principals in ongoing professional learning through continued access to coaches, professional development, and participation in more informal communities of practice.

Often, leaders of new schools have been teachers or leaders in existing network schools, so they have personally experienced the system designs and pedagogies needed. To support the process that allows “network DNA” to be transferred to their various locations and new sites, the networks create leadership pipelines. By immersing both teachers and leaders in reinforcing, collaborative, and experiential professional development, they create a workforce that can successfully instantiate their deeper learning and equity-oriented models in new and existing sites.

5. The networks are learning organizations that continuously evolve to improve their practices.

As the networks have grown, they have encountered challenges related to meeting the learning demands of a growing workforce and a diverse student population. Big Picture Learning, Internationals, and New Tech Network have turned these growing pains into both formal and informal opportunities for reflection and improvement. By maintaining a learning orientation, the networks have evolved in their practices, allowing them to adapt their approaches in community-responsive ways while maintaining fidelity to their models.

Implications

The systems that Big Picture Learning, Internationals, and New Tech Network have used to re-create their complex models elevate important lessons. Among these are insights that can inform districts and schools seeking to expand access to deeper learning and equity in a wide range of settings:

- **School design and pedagogy are intimately linked:** Deeper learning pedagogies require other structural changes that reorganize time and relationships within schools, including those that enable long-term relationships between teachers and students (e.g., through looping and advisories), those that permit longer blocks of time for project-based learning inside the school and interest-based internships in the community, those that allow teachers to work collaboratively in teams, those that support authentic assessments within and across classrooms, and those that provide the additional academic and social-emotional supports students need to succeed. Pursuing changes in pedagogies without pursuing new school designs is unlikely to succeed in producing sustainable models with strong outcomes.
- **Every member of the school community must learn deeply about the new approaches and why they matter** in order to make decisions and contributions that sustain these approaches: In addition to teachers and school leaders, central office leaders, school board members, teachers unions, parent and community groups, and local businesses need to understand deeply what new models of practice are seeking to accomplish and how they intend to do it. Each stakeholder has a key role to play in enacting and sustaining the changes over time.
- **Developing the sophisticated pedagogies needed to teach for deeper learning with equity requires new approaches to professional learning:** After-school workshops are not enough. Strategies include cross-school conferences and scaffolded coaching for leaders and teachers; observations of successful schools and classrooms; residencies; and curriculum supports, such as unit and lesson plans and authentic assessments. With these approaches to professional development, teachers can build on the tools expert teachers have developed and then adapt them to their needs. Educators thus have the opportunity to learn in ways that model the deeper learning they seek to create, that demonstrate the models and artifacts of practice that they can observe and emulate, and that build continuous collaboration in communities of practice.
- **School leaders must have significant knowledge of learning and successful experience in the new model** to be able to redesign the school and help enable the innovative practices it requires: If leaders do not understand both the pedagogies and system supports needed, they will struggle to create the environment needed for teachers to teach deeply and the supports needed for a wide range of students to learn in ways traditionally reserved for a small, select group of students.

These findings suggest considerations for district and school leaders interested in implementing and expanding deeper learning approaches in traditional public schools, especially for students from historically underserved racial, linguistic, and economic groups.

Considerations for Districts

District leaders seeking to expand deeper learning opportunities across schools or academies can:

- Develop explicit **deeper learning visions** that are not merely aspirational but rather are uncompromising guidelines for the design and implementation of deeper learning schools.
- **Redesign schools** in ways that strengthen teacher-student relationships, personalization, and teacher collaboration.
- Provide schools with **flexibility** in scheduling and other state or local requirements (e.g., graduation, credit fulfillment, and seat-time requirements). To allow deeper learning models to flourish, schools and districts should identify and seek out potential avenues that would allow for more flexibility in these areas or should reconsider these mandates.
- Invest in personnel who **facilitate partnerships** and communicate with local businesses, community organizations, and professional organizations about deeper learning to build support for these practices and their implementation. Deeper learning schools are best supported when multiple stakeholders are involved in the school's design and implementation and can extend school capacity and student learning.
- Work with higher education partners to design **pre-service preparation programs** for both teachers and administrators that provide a strong foundation in deeper learning and skills for supporting students' holistic needs. These should provide supervised clinical experiences in schools that are good deeper learning models with positive school climates, including network schools. Administrator preparation programs should help leaders learn how to design and foster such school environments.
- Offer widely available **in-service development** that helps educators continually build on and refine student-centered, deeper learning practices. These should include districtwide professional development, opportunities to learn from other schools through networks, site visits, and documentation of successes.
- Develop access to deeper learning **curriculum and assessment resources** through online repositories and forums.
- Invest in **deeper learning coaches** so that teachers and administrators can receive ongoing, on-site support in implementing deeper learning practices from those that maintain expertise in this complex approach.
- Foster a **pipeline of leaders** from the pool of increasingly expert teachers that can design and transform schools and academies to support deeper learning and equity. More systematic development of educators' abilities to implement deeper learning can support districts schools in creating leaders who can effectively implement these complex approaches across school sites.
- Develop **processes that support continuous improvement** of deeper learning practice and dissemination. These can include internal routines that periodically allow districts to diagnose challenges, develop and implement improvement strategies, and assess their progress. They can also include ongoing professional learning alongside other organizations to share and hone best practices. Engaging in a thoughtful evaluation of assets and potential challenges can help districts develop a well-informed and strategic approach to designing and improving schools that ensures equitable access and success for all of their students.
- Consider **partnering with deeper learning experts**, including deeper learning networks, to support the instantiation and sustainability of deeper learning schools.

Considerations for Schools

To bring deeper learning models and practices into schools or academies, administrators and educators can:

- Develop explicit **deeper learning visions** and assess what structures or systems will need to be in place to implement their visions.
- Create **master schedules** that allow for longer learning blocks and teacher collaboration within teams and departments to enable both adult and student learning.
- Implement **personalization and relationship-building structures** so that students can be known and supported. Such structures include creating small schools or learning communities within schools, looping teachers with students for more than one year, creating advisory systems, supporting teaching teams, and organizing schools with extended grade spans. Researchers have found that all these structures strengthen relationships and support students in deeper learning.
- Implement **restorative and culturally responsive practices** to create inclusive classrooms that better support learning.
- Ensure **integrated student supports** are available to promote students' health, mental health, and social welfare through community partnerships. These supports provide the foundation for productive learning and the rigor that deeper learning requires and can enhance students' well-being and sense of inclusion and belonging.
- Offer ongoing **in-service development** on deeper learning to build teacher expertise and facility with implementing its practices. Productive strategies would include whole-school professional development that is sustained over time, with opportunities for teachers to build and try new curriculum and practices and reflect with each other to improve them; collaboration within professional learning communities; opportunities to observe deeper learning approaches in action through within-school classroom observations and site visits to other schools; and opportunities to work alongside coaches and experienced staff members who can provide individualized support to practitioners.
- Design and implement **outreach to communities**, including hosting school events, site visits, and informational gatherings. Community outreach to community members, local businesses, and professional and community-based organizations can build local investment in deeper learning and provide internships, resources, and personnel that support student learning and/or build teacher capacity.
- Seek opportunities to **learn from deeper learning experts**, including deeper learning networks, to develop local expertise and investment in these practices and models.

This study has suggested how it is possible to plant and grow new approaches that move beyond traditional constraints to provide deeper learning that promotes equity on a large scale. In examining how some networks have re-created and sustained deeper learning models in dozens and sometimes hundreds of schools, we found that they have done so by attending to multiple dimensions of change. They have actively built local policy infrastructures to redesign schools and sustain deeper learning environments. They have built relationships and formal partnerships with local stakeholders to collaboratively engage them in the design and implementation of deeper learning. The networks have also built robust systems of professional development that support teachers and school leaders in ongoing and reinforcing ways. The networks have also remained

vigilant of their own practice and actively sought ways to continuously improve. The processes and systems have coalesced to support the sustainability and growth of these deeper learning models over time, helping to push against the obstacles that have often impeded fundamental change.

There is significant work to do to extend these kinds of practices beyond “educational niches”¹¹⁵ to entire districts and states. These findings demonstrate some of the strategies that may eventually lead to universal access to the kind of learning young people need to succeed in the complex, fast-changing world they live in and will soon lead.

Appendix A: Methodology

This multisite case study investigated networks that have partnered with traditional public school districts to disseminate deeper learning pedagogies to serve the needs of underserved students. The purpose of this research was to identify the systems and structures that have enabled these educational organizations to replicate their sophisticated and equity-oriented learning models in a high-quality manner. To this end, this investigation sought to answer the following five questions:

1. What are the pedagogical and school design features that develop students' deeper learning competencies in network schools?
2. What changes to school structures, policies, and operations have networks' pedagogical practices required or triggered? How are changes in school structures, policies, and operations enabled and supported?
3. What professional learning structures and practices do networks use to support high-quality teaching and learning across the network?
4. How do networks partner with districts, external organizations, and local communities to implement their models in ways that meet students' holistic and learning needs?
5. What challenges have networks faced in spreading their models to different sites? How have they overcome these obstacles to ensure that students have equitable access to deeper learning experiences?

Because the study sought to surface best practices related to high-quality implementation and dissemination of deeper learning, researchers used purposeful sampling to identify networks that could be “information-rich cases.”¹⁴ Rather than designing a study that could provide generalizable findings or demonstrate variation between and among schools, the research team sought to learn from networks that represent positive outliers—those that have demonstrated exemplary success in scaling up deeper learning practices in partnership with school districts and have supported their students' academic, social, and emotional growth, particularly among students who face adverse circumstances. Identifying the structures that have facilitated the success of these exemplar cases provides insights into the promising systems that can enable sophisticated deeper learning models to take hold, thereby highlighting lessons that can inform policy and practice.

Big Picture Learning, the Internationals Network for Public Schools, and New Tech Network are examples of information-rich cases and were thus selected as the focal networks for this investigation. Each network has an exemplary track record of partnering with school districts to found and sustain deeper learning schools as evidenced by their large geographic presences and long institutional histories. Furthermore, data suggests that students attending these network schools—most of whom are furthest from social and economic opportunity—are excelling academically and in noncognitive domains. (See “The Networks” section for each network's data.) While there are other networks that have replicated deeper learning schools successfully and advanced student outcomes, we considered geographic and programmatic diversity to further bound our sample. We identified networks that varied in their deeper learning school models and considered their geographic spreads to generate an exemplar sample that represented an array of approaches and spreads. Given their substantial presence, impact, and diversity, investigating Big

Picture Learning, Internationals, and New Tech Network allowed researchers to understand how the networks have successfully instantiated their deeper learning and equity-oriented models in unique and disparate contexts and what lessons can be garnered from their approaches.

To answer the study's research questions, a six-person research team engaged in an in-depth, nested case study approach. Case studies allow researchers to investigate real-life phenomena *in* context, thus generating understandings of a phenomenon and its interplay with its environment.¹¹⁵ This design is also best suited to studying phenomena that require an analysis of multiple sources of data and when the researcher has little or no control over what is studied.¹¹⁶ With its sensitivity to context and its ability to capture a multitude of processes, a case study approach was an appropriate and ideal method to elucidate the dynamic and complex ways that the networks disseminate their practices.

While case studies can be conducted holistically, nested case analysis generates particular benefits. It allows researchers to explore a given phenomenon alongside an in-depth analysis of embedded subunits that can provide additional insights and nuance. Nested case studies also enable researchers to examine similarities, differences, and patterns within and across the embedded cases, providing more opportunity to corroborate evidence and illuminate individual case dynamics.¹¹⁷ This report presents a holistic assessment of how the focal networks have disseminated their deeper learning models while also elevating distinct network approaches where relevant.

Data Collection

Data was collected from July 2017 to May 2018. The six-person research team subdivided into three groups, each of which spearheaded the data collection efforts for one of the three networks. Primary data sources for this study include interviews, observations, and documents.

Interviews

The research team conducted a total of 71 interviews with key stakeholders, including network founders, network senior leaders, principals, teachers, and district officials in cities with schools affiliated with Big Picture Learning, Internationals, and New Tech Network. (See Table A1.) Interviews were conducted in multiple rounds. For the initial wave of interviews, the team used purposive sampling to identify network founders and senior leaders who could speak to each network's history, its evolving practices and approaches to growth, and the challenges and successes it has faced in spreading its deeper learning models in unique locales. After this first set of interviews, researchers used snowball sampling¹¹⁸ to identify additional study participants, asking network leaders to recommend individuals at the network or school level that could fill in knowledge gaps and further address the study's research questions. This strategy used the knowledge and experience of network staff to identify respondents who could best speak to systems and structures that the network develops and implements to disseminate its teaching and learning practices across the country.

Interviews were semi-structured and lasted 45–90 minutes. Interview prompts asked participants to describe the network's key pedagogical and equity practices, its replication and onboarding processes, its approach to collaborating with districts and communities, and its professional learning structures. Interviewees were also asked to discuss challenges that have emerged in the development and implementation of network systems and how the network has addressed and

overcome emerging concerns. At times, the researchers tailored the protocol based on the role of the interviewee and his or her tenure with the network. This differentiation ensured that particular questions could be explored in more depth with the respondents who were most likely to hold relevant knowledge on the topic. Each interview was audio recorded for transcription purposes if the respondent gave consent to do so.

Table A1
Study Interviewees

Role	Big Picture Learning	Internationals	New Tech Network	Total
Network Leaders	11	5	6	22
Principals and Administrators	4	3	4	11
Teachers and Teacher Leaders	8	6	9	23
District or Third-Party Organizational Staff	4	2	2	8

Observations

Observations comprised the second primary data source. The research teams attended a total of six professional trainings and network meetings—two for each network. For Big Picture Learning, the research team attended the network’s annual Big Bang conference, which gathers teachers, principals, network leaders, and affiliates each July, and the Leadership Conference, which is held each December to meet the needs of site leaders, district affiliates, and interested parties. For New Tech Network, the research team attended the New Tech Annual Conference, which brings together approximately 1,200 teachers and leaders from its existing and developing schools, and a Teacher Residency, an immersive experience for a developing school. For Internationals, the team attended formal summer and fall professional development trainings intended for all teachers in the network. Attendance at these events provided insight into the networks’ approaches to professional development and model dissemination and allowed researchers to triangulate data retrieved from interviews and documents on network professional learning supports.

The two-person teams also conducted site visits to two schools affiliated with each network. Each team identified and visited an established or mature network school and one that had recently adopted the model to observe practices and to interview school leaders and teachers in more convenient locations. (See Table A2 for a list of site visits.) Visiting network sites at different stages of implementation allowed researchers to garner a range of perspectives and insights from individuals that varied in their affiliations with the organization and/or their familiarity with the network’s deeper learning model. These visits were not intended to provide generalizable evidence of the network’s approach to implementation and scale but rather to see different manifestations of the network’s vision and the degree to which shared principles and systems guided the work at the local level.

Table A2
School Site Visits by Network

Network	Established Network Site	Developing Network Site
Big Picture Learning	Highline Big Picture (est. 2005); Burien, WA	Union High School (est. 2015); Nampa, ID
Internationals Network for Public Schools	San Francisco International High School (est. 2009); San Francisco, CA	International High School for Health Sciences (est. 2013); New York, NY
New Tech Network	Cougar New Tech Entrepreneurial Academy (est. 2013); Greenville, SC	Carolina High School (est. 2014); Greenville, SC

Documents

The final data source for this study was organizational documents. The research teams collected and reviewed 165 documents, including:

- **Research studies:** evaluation and performance reports for each network
- **Administrative documents:** organizational policy statements, Memos of Understanding (MOUs), organization charts, web pages, presentation slides, and strategic plans for each network
- **Curriculum and assessments:** training materials, curriculum overviews, classroom visuals, and rubrics for teacher feedback and performance assessment

Researchers reviewed these documents to understand each network's history, its mission and impact, and its programmatic approach for teacher and student learning. Curriculum and assessment materials also helped researchers triangulate data with regard to the continued implementation of the network's deeper learning approach and its system of professional learning supports.

Analysis

To analyze the data, the researchers engaged in a multistep process. First, they created a preliminary code list based on the ideas present in the semi-structured interview protocol. They then refined the codebook after site visits to include themes, structures, and practices that emerged from the data around each network's deeper learning and diffusion approach. In this process, researchers clarified, added, or deleted codes from the initial list to improve code definitions, minimize redundancy, and capture district dynamics.

Once the codes were refined, researchers applied them to interview transcripts, field notes, and documents using Dedoose qualitative analysis software, a web-based application for qualitative analysis. To increase inter-rater reliability, researchers met weekly or biweekly to discuss and compare their code applications in order to refine their analyses and their findings' consistency. Once coding was completed, researchers triangulated findings across multiple data sources, seeking confirmatory and disconfirmatory evidence, and developed memos of the well-substantiated points that emerged from the evidence.

Appendix B: Competencies Needed for Deeper Learning by Network

Big Picture Learning. To enact its workplace and interest-based learning model, Big Picture Learning documents suggest that the following skills and orientations are foundational to teachers' abilities to successfully implement its approach:

- **Relationship-building:** The ability for a teacher to “get to know students and families well and create an inclusive learning team in order to create relevant, challenging, and supportive experiences for each student.”
 - This competency helps foster inclusive advisory cultures and emphasizes the need for teachers to build supportive relationships so that they can understand a student's personal and academic history to co-design a learning trajectory around his or her interests.
- **Project and authentic assessment design:** Ability to support students in identifying and designing projects (e.g., goal-setting, backward planning, and timeline creation) that are connected to their interests and to guide students through formal and informal authentic assessments.
 - Advisors must be adept listeners and pose open-ended yet directed questions that allow students' interests to emerge and drive the project development and performance assessment process.
- **Interdisciplinary curriculum development:** Direct students to resources that allow them to build their skills, knowledge, and academic content as they explore the literary, mathematical, historical, and scientific elements of their projects and internships, which they then incorporate into their projects, exhibitions, and final products.
 - To do this, teachers must maintain a holistic and transdisciplinary view of student learning that draws on multiple areas of work and experience and, in turn, help students synthesize any insights they gain into their projects.
- **Differentiation:** Maintain strong differentiation skills to enact the network's “One Student at a Time” philosophy.
 - Also called personalization, Big Picture Learning staff individualize educational goals and experiences for each student based on his or her interests, through individualized learning plans, and provide direct support around core content to meet his or her academic and social-emotional needs.
- **Project management:** The organizational skills, structures, and processes that enable teachers to monitor each student's unique progress, projects, and internship-based learning opportunities.
 - Big Picture Learning teachers also teach students these same skills. They do so by helping students identify and use appropriate tools that will improve organization, self-management, and reflection.

- **Problem-solving:** The ability to think nimbly or to “collaborate and use resources to help students academically and nonacademically.”
 - Big Picture Learning advisors bring together essential supports to clarify an issue, to extend student and professional learning, and to secure social-emotional supports for students when relevant. Big Picture Learning advisors also demonstrate flexible thinking as they work with students and other advisors to design and implement projects based on their evolving interests.

Internationals. To implement its deeper learning approach to supporting recently immigrated English learners, teachers at Internationals schools must maintain and hone the following competencies:

- **Equity and growth mindset:** Have the mindset that all students can achieve despite language barriers, limited formal education, and/or English proficiency.
 - In action, this includes teachers maintaining a social-justice commitment and having sophisticated cultural competency skills to work with immigrant youth from many different countries and cultures. It also means that teachers take the long view that prioritizes all students achieving and graduating, which requires flexibility and patience in the short term (e.g., supporting students over 5 or 6 or even 7 years).
- **Language development:** Integrate literacy instruction across disciplines and subject areas to continuously emphasize language development alongside rigorous, age-appropriate content.
- **Differentiation:** Be versatile in implementing necessary scaffolds to support English learners, including leveraging students’ native languages to support English learning, explicit vocabulary instruction, the use of sentence and speaking stems, and ample opportunities for oral and written communication.
 - At Internationals, this also includes the use of appropriate scaffolds for students of different age groups and levels of academic and literacy proficiency.
- **Student-centered, project-based learning and performance assessment practices:** Implement collaborative projects that help students develop their linguistic and academic skills and embed performance assessments into their ongoing curriculum and instruction.
- **Focus on the whole child:** Work closely with families, counselors, and other Internationals staff to help students face and overcome social-emotional challenges, including significant trauma as a result of immigration or discrimination.
 - Internationals teachers also create strong relationships with students and build inclusive environments through advisories, which is another avenue they use to support the whole child.
- **Collaboration and mutual accountability:** Ability to collaborate with colleagues to support interdisciplinary learning and to generate strategies to support students academically and holistically.
 - Being collaborative at Internationals also means making practice public, often welcoming teachers to visit classrooms to provide feedback, participating in a peer review evaluation process, and/or engaging in collective thought partnership with colleagues in school, across the network, or in external organizations.

New Tech Network. New Tech has also identified teacher attributes that it believes are necessary for teachers to have and/or develop in order to effectively enact a project-based learning approach.

- **Growth mindset:** Seek opportunities to lead and support other adults in their own growth and learning.
- **Project-based learning:** Utilize deep content understanding to apply standards to learning experiences that are complex and meaningful.
 - At New Tech Network, this attribute not only includes understanding how to engage students in complex, meaningful tasks to deepen their disciplinary knowledge, but also refers to maintaining a commitment to project-based learning as a powerful instructional approach.
- **Differentiation:** Build upon success and research-based approaches to create a classroom environment that meets the range of student learning needs.
 - This includes developing structures and cultures that are needed in student-centered classrooms as well as using instructional strategies to support student learning (e.g., formative/summative assessments and scaffolds).
- **Data use:** Utilize data and reflective practices to drive innovation and to solve problems.
 - Using data at New Tech Network is particularly aligned with garnering feedback. Data can inform continuous improvement and the development of professional and student learning goals.
- **Interpersonal competence:** Actively seek to promote the growth of interpersonal competence (e.g., self-awareness, self-regulation, and self-motivation) in learners and adults.
 - In New Tech Network schools, this can be seen in the promotion of team-centric environments and the explicit teaching of these interpersonal skills. It also involves effective communication and conflict resolution among students, teachers, families, and the community writ large.
- **Community-oriented:** Be a highly valued member in the community and seek opportunities to better connect the school with the community.
 - New Tech Network teachers can develop and hone this attribute as they encourage students to engage with the community or as they bring the community into students' projects.

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