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REINVENTING PUBLIC EDUCATION

Mind the Gap:
Will All Students Benefit From 21st Century Learning?

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About this Project

This paper is part of a multiyear, multimethod study of 39 schools that participated in the Next Generation Learning Challenges (NGLC) Regional Funds for Breakthrough Schools initiative and the Next Generation Systems Initiative (NGSI), both supported by the Bill & Melinda Gates Foundation. The study looked across a range of schools in 17 sites to learn how early implementation was going in classrooms and the systems that surrounded them. This paper relied on the qualitative field work conducted for the study. The study's overall findings are highlighted in a cross-cutting report, *Personalized Learning at a Crossroads*, that summarizes lessons from the project.

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Striving for Equity

In an economy driven by technological innovation and a complex social landscape, schools can no longer count on traditional academic preparation to set children up for success later in life. The types of skills that will enable students to succeed in the 21st century—such as the ability to solve complex problems, transfer knowledge to new domains, and communicate with diverse audiences—are distinct from those routinely offered in K–12 education.

To remedy these gaps, educators, school districts, and philanthropists have looked to a set of approaches that go by a variety of names (e.g., deeper learning, personalized learning, student-centered learning) but rest on a set of instructional approaches that allow students to express more agency over their learning and create space to apply what they learn to solve real-world problems. These approaches, which we refer to in this paper as "21st century learning," are not new to education, but they have historically only been accessible to the most privileged students.[1] Today's movement to expand access to these experiences to underserved students moves into uncharted territory. Will it, as proponents hope, remedy past inequities or instead prove to be another initiative that, despite best intentions, sustains the ones that already exist?

This paper offers a first look at whether contemporary investments in 21st century learning are likely to pay dividends to students who have historically not benefited from these experiences, including students from low-income families and students entering school who have fallen behind. Drawing on a national study of schools implementing these practices and a deep look at two states, we consider how academically disadvantaged students experience these learning environments and what factors contribute to their success with these approaches.

We find that while 21st century learning is embraced by a surprisingly high number of schools serving historically underserved students, the uptake of these approaches does not always translate into better learning opportunities for those students. Our interviews and observations suggest that:

- Teachers often lack the tools and skills to provide rigorous and engaging instruction to students who possess weaker academic and social-emotional skills.[2]
- Shifting to 21st century learning environments can stress preexisting capacity challenges in high-needs schools.
- States and districts have not established systems to monitor or mitigate the inequities that exist within schools and classrooms.

We conclude that without greater attention to critical supports and a willingness to address deep structural barriers that limit teacher and school capacity building, 21st century learning is unlikely to deliver on its promise to students most in need.

These findings have important implications for researchers, funders, and policymakers.

Researchers must learn what types of instructional approaches and schoolwide structures can effectively support students in achieving 21st century competencies, especially students who enter school with weak academic preparation and underdeveloped social-emotional skills.

Funders can and should support the research and development necessary to design, test, and implement breakthrough 21st century learning models that can succeed with students entering school who have fallen behind. They should also support new human capital pipelines that prepare teachers and leaders to teach in 21st century learning environments.

District leaders interested in supporting 21st century learning should prepare themselves to engage in the system-level change required. This means reimagining the role of the central office to support new instructional approaches, including work to build pipelines of educators prepared to work in these environments and addressing weaknesses in instructional supports. It also means addressing structural barriers that prevent schools serving disadvantaged students from hiring qualified teachers and gaining access to resources that will enable them to succeed. Additionally, district leaders should prioritize developing key academic and social-emotional skills in preschool and elementary school so that students are better prepared to enter 21st century learning environments as they advance through K–12.

State leaders can expand their reach and impact by supporting widespread access to high quality curriculum and assessments that target 21st century skill sets. While state accountability systems can pose barriers to implementing innovative new instructional models, they also serve as the primary method of monitoring inequities. But these systems are meaningless unless they measure and support the types of skills that are essential to students' future success.

Traditional academic preparation is no longer sufficient to set students up for success. Yet, if educators, funders, and policymakers do not change how they approach the work of 21st century learning, many students will remain shut out of the opportunities that promise to prepare them for an uncertain future.

Why 21st Century Learning?

Although definitions can be difficult to nail down, 21st century learning environments strive to develop student skill sets that extend beyond traditional academic expectations. This approach pushes students to apply their knowledge through critical thinking, problem solving, and effective written and verbal communication.[3] Additionally, 21st century learning strives to develop students' social-emotional skills, such as persistence, eagerness to engage with challenging problems, and collaboration.[4] A substantial and growing body of literature links such rich and comprehensive learning experiences to student achievement and healthy youth development.[5]

Confusion around what 21st century learning means and looks like is a challenge for those who study and advocate for the approach. 21st century learning comes in various flavors (e.g., personalized learning, project-based learning, problem-based learning, community-embedded learning). While some technical assistance providers and 21st century learning networks focus on a particular approach, many schools employ a variety of strategies. For example, Summit Public Schools uses project-based learning, mentoring, community-embedded learning opportunities, and an online platform that structures students' ability to self-pace through academic content.

While 21st century learning is increasingly en vogue, these types of learning experiences are not new. Similar approaches, earlier deemed "progressive education," gained momentum in the early 20th century and the 1960s, only to recede into the shadows as the nation's schools refocused their attention on teacher-centered instruction and factual recall. Inconsistent demand for this approach, weak professional development for educators, and a push for major instructional reform in isolation of broader structural and cultural changes are among the reasons that these efforts never meaningfully took hold in the majority of America's classrooms.[6] When they were embraced, educators often struggled to grant students the opportunity to self-direct their learning while holding them to high academic standards, leading critics to label progressive schools "time-wasters," "playhouses," and "educational wastelands."[7]

These challenges continue today. In a recent study, Jal Mehta and Sarah Fine found that "the schools that were more progressive, in a Deweyan sense, often struggled to ensure that students consistently mastered basic academic content, whereas the more traditionally academic schools struggled to make their material authentic and connected to students' interests."[8]

While no student is well served by learning experiences that are unengaging, fail to support their academic progress, or both, implications for schools missing the mark on these dimensions loom largest for students who have historically struggled in traditional K–12 environments. As Mehta observes, 21st century learning offers these students new ways to make school engaging and relevant. Moreover, underserved students are less likely to have access to the out-of-school experiences that support the development of 21st century competencies and more likely to enter school with skills gaps that make navigating these learning experiences challenging.[9] Put simply, without access to 21st century learning within schools, underserved students will exit K–12 systems without the skills that many believe are essential preparation for college, careers, and life.

While a number of observers have openly worried that schools serving historically underserved students will be left out of the 21st century learning movement, today's leading networks engage a diverse set of schools, including those serving a high percentage of students from low-income families. Schools participating in leading 21st century learning networks, including the Next Generation Systems Initiative, Summit Learning, New Tech Network, and Expeditionary Learning, tend to serve students

with poverty levels equal to or greater than other schools in their local school districts and national averages.[10] Outside of these leading networks, evidence from a national student survey reveals few systematic differences in exposure to 21st century learning experiences by student race, ethnicity, or socioeconomic status.[11] But these data leave unanswered key questions about how students of different backgrounds experience 21st century learning.

Studying Equity in 21st Century Education

This paper uses a mixed methods design to understand how students experience 21st century learning, as well as the school, district, and state factors that shape student access and success. We draw from deep dives into two states, Colorado and Connecticut. Both are in the early stages of developing opportunities for schools and districts to embrace 21st century learning through changes to state assessment, accountability, and seat-time requirements. For example, both states have expanded their accountability frameworks to include student growth and college readiness indicators, and both states have granted schools new competency-based flexibilities around how students accrue graduation requirements.[12] As such, they are good examples of how the typical state might move to support schools as they pursue a 21st century learning agenda.

To explore this issue further, we used data collected for a broader study of Bill & Melinda Gates Foundation personalized learning grant recipients, adding a field visit to one Nellie Mae Education Foundation grantee school outside of the Gates Foundation personalized learning cohort to increase the representation of Connecticut schools in the sample.[13] These data included three field visits to 39 schools in 11 states, including nine in Colorado and one in Connecticut. In each school and district we visited, we interviewed students, teachers, principals, district leaders, and support organizations, and conducted formal and informal classroom observations. We used content analysis software to code qualitative data and to develop data matrices that isolated key supports and barriers at the classroom, school, district, and state levels. These data guide our understanding of how students experience 21st century learning environments, as well as the school and district factors that shape those experiences.

Though the schools we visited were pursuing 21st century learning, in practice this work took many forms. Schools might prioritize using technology to support differentiation and self-directed learning, competency-based grading and progression, or the use of projects and field experiences to make learning more relevant. These approaches often have similar goals—to provide students learning experiences that are more meaningful and productive than those traditionally offered—but they are admittedly disparate in form and, in many cases, poorly articulated.

As a result, none of the sites we studied might be considered exemplars of 21st century learning. While the educators we spoke with enthusiastically embraced the goals of 21st century learning, many struggled to translate these ideas into practice. Our findings speak to how 21st century learning experiences play out under typical, rather than ideal, conditions.[14]

Findings

Across the schools we studied, we observed several trends that suggest students who enter schools with weaker academic preparation and social-emotional skills are less likely than their more advantaged peers to have the opportunity to experience 21st century learning as it is currently being implemented. Systemic factors, including teacher preparation and skill gaps and the absence of well-defined tools and supports, contribute to students' inconsistent experiences.

Finding #1: Teachers often lack the tools and skills to provide rigorous and engaging instruction to students who possess weaker academic and social-emotional skills.

The intuitively attractive goals of 21st century learning energized nearly every educator we talked to. But enthusiasm for this work does not, on its own, translate these goals into reality. In all but the strongest teachers' classrooms, students' opportunity to meaningfully engage in 21st century learning was tied to their academic preparedness and social-emotional skills.

We find two key classroom-level reasons behind the diluted and inconsistent implementation we observed. First, teachers struggled to navigate the tension between differentiating instruction for students and holding them to high academic expectations that ensure they meet grade-level targets. Second, 21st century learning requires students to possess strong social-emotional skills, but few schools have systems in place to support the development of these skills in students who lack them. Without more work to address preparation gaps, some students are likely to be left behind.

Educators have not addressed the tension between differentiating instruction and developing 21st century competencies. 21st century learning experiences strive to go beyond traditional academic preparation to develop students' higher-order thinking skills. Yet in many of the schools we visited, 21st century learning experiences were limited to students who possessed the requisite academic preparation. Students who entered school behind their peers were often relegated to remedial activities that did not enable these students to develop 21st century learning competencies.

One Connecticut principal reflected on the tension between differentiating learning experiences to meet kids "where they are" and holding all students to high academic standards:

> *"[It's] a good challenge for people. And I think it's just a growing pain that no one's really mastered."*

The principal's reflection that few educators understand how to differentiate content, product, and process while also holding students to high academic standards is striking and concerning. But even more concerning is how rarely educators even acknowledged this tension in our interviews with them. Rather than grappling with how to provide all students—even those who entered school far behind their peers—with 21st century learning experiences, most teachers fell back on offering remedial instruction.

Although our data do not specifically include measures of academic rigor, we observed several projects that pushed some students to engage in critical thinking and problem solving, while allowing other students to engage in rote work. In some cases, teachers' efforts to personalize instruction meant that students did not get a chance to develop 21st century competencies or access grade-level content. For example, in one high-poverty school we observed a classroom where a group of students engaged in a student-driven project focused on the ecological impacts of climate change while another group of students worked on remediation worksheets at a table in the back of the room. In an effort to address gaps in academic preparedness, these teachers compromised depth of learning.

In another classroom, students were hard at work on projects, measuring area and volume while building

an object of their choice. One student was making a scale model of a circus tent with three peaks of different sizes and an entrance hallway. She was measuring columns, cones, semicircles, and rectangles. A second student had drawn a pizza and was computing the area of the circular pepperoni. This project, which relied upon a two-dimensional object and ignored the volume component of the project, was decidedly less complex than the circus tent project. Finally, in the corner of the room, a third student sat in front of a computer with one hand on his head, mindlessly clicking through math software. This student was significantly behind academically and his teacher had assigned him to remedial practice to get him up to speed, but he looked bored as his classmates were up and about working on their projects. The teacher has intentionally created learning tasks that would reach every student at his academic level. But just one of the three students we observed was engaged in the rigorous work 21st century learning promises. As one Connecticut teacher poignantly observed:

> ***"[A concern is] the watering down of expectations."***

Some teachers were able to find ways to address gaps while engaging students in rigorous work. One particularly strong teacher assigned a project that required students to create a podcast that included a student-conducted interview. Recognizing that not all students in the class possessed the skills to engage in the project independently, the teacher provided scaffolds, including helping students determine the topic and identifying work processes that would enable them to complete the assignment. One student ultimately interviewed the teacher on what it is like to be a new parent—an experience that the teacher and the student shared. This enabled the teacher to be supportive throughout the process by helping to make the arrangements and offering prods during the interview, while providing the student an opportunity to engage deeply in a project that his peers were also completing.

Few schools have structures in place to develop the skills that position students to succeed in 21st century learning environments. While 21st century learning involves developing social-emotional skills like self-direction, self-regulation, and self-efficacy, many educators told us that such skills are also a necessary foundation for students to learn in environments that grant them heightened levels of autonomy and agency over their learning.[15] This circular thinking is especially concerning for low-income students, who are more likely to enter school with weaker social-emotional skills[16] and less likely to have had structured learning experiences that support self-direction outside of school.[17]

Few educators we talked to openly addressed or acknowledged this challenge. Instead, teachers most often did what leading advocates for 21st century learning told them to do—they provided students the opportunity to self-direct. But without guidance on how to support students who enter school with weaker social-emotional skills, many teachers did not offer students explicit coaching or structures to support self-direction. Students observed the highly varied outcomes that resulted; one Colorado high school student said:

> ***"If I don't have someone to check up on [me], make sure I'm doing my work, it's not going to get done."***

Teachers similarly noted problems related to students' weak work habits, but few discussed strategies for addressing these problems. One teacher noted:

> ***"[Students'] time management is definitely something that causes me great anxiety, particularly when … there are tasks that depend on them to work largely independently for extended periods of time, that is very challenging."***

Another teacher in a high needs school in Connecticut observed:

> ***"If a kid comes in with the soft skills to be able to manage their time and organize their activities … if they could do that independently, then that's one thing, but I'm not sure that a lot of my students have that when they come in."***

If all students are to reap the benefits of 21st century learning, educators must support students in developing social-emotional skills and address gaps in academic preparation without compromising opportunities to take ownership, collaborate with peers, and engage in deep learning. Neglecting these gaps is particularly worrisome considering that low-income students and students of color are disproportionately represented among students who enter school behind their peers.[18] The result is that disparate access within schools is likely to also fall along the lines of race and socioeconomic status.

Finding #2: Shifting to 21st century learning environments can stress preexisting capacity challenges in high-needs schools.

Teachers and principals working in schools we visited struggled to name specific skills that educators need to be successful in 21st century learning environments but emphasized that the work requires educators to be masters of their crafts, as traditionally conceived. We heard that teachers must be experts at lesson planning, classroom management, and data use, and that principals must be strong instructional leaders, communicate expectations for students and staff, and excel at using data to direct school priorities. For both teachers and leaders, many emphasized the importance of risk-taking and a culture of collaboration and professionalism. These skills are not unique to 21st century learning environments, but their importance is amplified in these contexts.

Like other major shifts in instruction, moving to 21st century learning requires principals to articulate a clear vision and theory of action, grounded in common language and culture. Yet in many of the schools we visited, principals delegated the responsibility to define 21st century learning to teachers who often lacked support, leading to widely disparate student experiences within a single school. As one teacher explained:

> ***"You can create a … culture in your classroom, but you also have to have a culture in the building that supports this kind of work… We have a clear sense of what we want our classes to look like, but we haven't done the hard work to create a culture where that can happen consistently."***

While the lack of a coherent vision for instruction is a problem in any school, high-needs schools often face preexisting capacity challenges that make addressing these gaps difficult. A larger number of teachers in high-poverty schools are new to their profession and, like many new teachers, struggle with foundational skills.[19] Additionally, very few teachers and leaders graduating from educator preparation programs enter the system trained to work in a 21st century learning environment. High teacher and principal turnover rates also challenge efforts to build institutional knowledge and capacity over time.[20] One leader in a high-needs Connecticut district, lamenting the teacher turnover that plagued the district schools, observed:

> ***"Any traction we begin to make from our [21st century learning] work at the district level tends to have to be repeated each year."***

One possibility for addressing the weaknesses in teacher and leader capacity is to adopt well-codified, evidence-based 21st century school models. But nationally, there is a shortage of such models that have been proven effective with at-risk student populations. Even when school and district leaders tour leading 21st century schools, they find it difficult to translate what they observe into their contexts. One district leader recalled:

> ***"We went up to New Hampshire and we saw what they were doing, but again, small district. I want to see how can a larger, urban district that has a significant population achieving below grade level move toward mastery."***

Lacking visible models, school leaders feel they are left to create their approach from scratch. But the difficulties of innovating while simultaneously operating a full-grown organization are well established.[21] Schools with inexperienced staff and high staff turnover are unlikely to be among the exceptional few that can take on this demanding task.

Students did not mince words when describing struggling teachers' classrooms—one student observed:

> ***"[The teacher] didn't know what she was doing...There was no lecturing at all, it was pretty much all independent study, which was really hard because we're all used to lectures... So we were all confused... It's like, 'Hey, just go research this.'"***

With or without 21st century approaches, teachers in the highest-needs schools arguably have the hardest jobs. Asking teachers to use ambiguous new approaches in these already difficult circumstances can be a recipe for chaos.

Finding #3: States and districts have not established systems to monitor or mitigate the inequities that exist within schools and classrooms.

Many states and districts have expressed enthusiasm for 21st century learning and have sought to support broader uptake of this work by granting districts and schools new flexibilities from rules that may limit implementation. For example, some states have granted new pathways to graduation and allowed schools and districts to use an array of student assessments. But while these efforts have helped to seed 21st century learning in a number of schools, neither states nor districts have established systems to monitor and mitigate the inequities that clearly exist within schools and classrooms or alter the way they work to support better implementation. Indeed, in some cases, state and district systems undermine educators' ability to deliver high-quality 21st century learning experiences.

Misaligned district and state assessment and accountability systems is one well-known frustration for educators in 21st century learning environments. As one principal said:

> ***"We're personalizing every day, then we're saying, 'Here, take this multiple-choice district assessment'... The old assessment doesn't work anymore. It's apples to oranges."***

This misalignment is particularly problematic for ensuring that 21st century learning experiences benefit students who enter school behind their peers.[22] In high-stakes accountability environments, schools and teachers are incentivized to use instructional approaches that they are confident will get students to perform well on state assessments—an incentive system that shapes teachers' instruction even more strongly when their students are not at grade level. In these environments, teachers face difficult choices. The boldest teachers may take a leap of faith and choose to disassociate their instruction from assessment and accountability systems, trusting that 21st century learning will translate into strong results on state tests. Other educators will take the safer road, sporadically engaging in these approaches in classes that are not tested, as time allows, or with students who perform at or above grade level. As one Colorado district leader acknowledged:

> ***"It's kind of a scary time right now to be a teacher... with [the] PARCC standardized test... They [are] just being very, very reluctant to try a lot of things."***

In addition to misaligned assessment and accountability challenges, we found districts' curriculum, instructional support, and human capital pipeline supports to be at odds with ambitions to achieve 21st century learning. A curriculum and instruction specialist observed that the work schools were tasked

with and the district's pacing guide are:

> ***"…literally polar opposites. What we are training ourselves to do with our core curriculum … is almost 180 degrees opposite of [21st century learning]."***

As a result, schools pursuing 21st century learning must search for or create their own resources, which frequently means teachers work on their own to self-curate what they use in class. This additional burden further straps schools' already limited capacity and often results in curriculum resources that range widely in their quality and rigor.

The misaligned policy environment we observed in states and districts in this study left many educators confused about how to create 21st century learning experiences. Common mantras among teachers and leaders in 21st century learning schools are, "experiment," "take risks," and "fail forward." But few structures support this experimentation to guide teachers' learning. This kind of risk taking may be particularly problematic in high-poverty schools, many of which face huge gaps in their students' learning and strong pressures to improve. Leaders of such schools in our sample noted that if test scores dipped, their work to put 21st century learning into practice would "*be on the chopping block*." Other leaders sensitive to accountability pressures encouraged instructional experimentation more frequently in non-tested subjects and after the completion of testing at the end of the school year.

States and districts, of course, do not intentionally create misaligned systems and supports. In some cases, system leaders are working individually with school leaders to remove barriers to school-level adoption of 21st century learning, as operationalized in a given school. But one-off efforts with individual school leaders is a labor-intensive and unscalable solution. States and districts would do better to establish a clear system-level vision for the work and align support structures. In the absence of a common vision for 21st century learning, assessment systems and curricular supports will continue to be misaligned and educators will continue to take instructional risks with little guidance on their professional progress.

Implications and Conclusion

21st century learning has the potential to support whole-child development, provide students with rich and engaging educational experiences, and prepare students for success later in life. But these approaches must be implemented with care. To date, most investments in 21st century learning have been in the on-the-ground work of teaching and learning (e.g., through adopting a program or curriculum designed to support 21st century learning). Fewer resources have gone toward activities that support improvement within a school (e.g., professional learning communities, regular data use to drive schoolwide priorities) and field-level capacity building.[23] To productively develop the 21st century learning landscape, aligned efforts must exist at all levels of the system. In the absence of such efforts, attempts to use 21st century learning may exacerbate challenges for students and undermine efforts to close the opportunity gap.

These findings give way to important implications for funders, policymakers, and practitioners.

1. **Build the evidence base around the impact of weak 21st century instruction on different types of schools and student groups.** Our research surfaces important equity concerns about students' experiences in 21st century learning environments, but our sample is limited and we did not assess learning outcomes. Further research should explore how widespread these problems are, specify the contexts in which at-risk students have the richest 21st century learning experiences, and identify successful approaches to providing these opportunities to all students.
2. **Use strategies at the state, district, and school level to enable all students to succeed with 21st century learning.** Although many proponents of 21st century learning have called for school and system leaders to adjust how they work, very few have done so.[24] State, district, and school leaders can support broader access to and success with 21st century learning by:

    - Establishing school feeder patterns that develop students' academic skills and social-emotional skills earlier.
    - Supporting the adoption of evidence-based approaches to developing students' social-emotional skills.
    - Supporting educators to scaffold 21st century learning experiences so students who enter school with preparation gaps are not left out.
    - Developing strategies to address gaps in academic preparation that do not compromise 21st century learning for the sake of differentiation.

    While these strategies have yet to reach any level of scale, examples abound of how they can help address some of the challenges we observed. For example, Tacoma Public Schools in Washington state launched the "Whole Child Initiative" in an effort to build students' social-emotional skills and develop learner communities. Participating schools have worked to develop, define, and teach social-emotional skills through the implementation of evidence-based interventions like Second Step, Positive Behavioral Intervention and Supports, and Zones of Regulation. Tacoma is one of six urban districts working to develop students' social and emotional skills through investments by the Wallace Foundation.

    At the same time, while there is a nationwide shortage of teaching models that have shown success in supporting students entering school behind their peers to participate in 21st century learning experiences, some teachers are able to overcome these challenges. As Mehta discusses, the most effective educators did not substitute remedial instruction for rigorous 21st century learning but instead provided appropriate scaffolds and supports so students with preparation gaps could

meaningfully participate.[25] The Buck Institute for Education offers resources and support to help educators identify strategies for differentiating instruction while offering students who enter school behind their peers opportunities to engage in 21st century learning.

3. **Invest in research and development to build new, high-quality 21st century learning models.** To date, efforts to support underserved students' access to 21st century learning have prioritized scale over quality. But as we have shown in this paper, underserved students have the most to lose when schools lack the capacity to deliver on the aspirational promises of 21st century learning. Education leaders considering investments in these approaches should determine whether schools possess the requisite capacity to address gaps in academic preparation and social-emotional skills, and exploit opportunities to develop new schools designed explicitly for this purpose.

   While the education landscape has a small number of school models designed to support 21st century learning, it is not clear that these models are equally effective with all students. The field desperately requires clearly codified, accessible strategies for closing students' knowledge and skill gaps so that all students can succeed in 21st century learning environments. These models are unlikely to emerge by "letting a thousand flowers bloom."

   We are beginning to see an increasing number of efforts around research and development emerge. Improvement science is rapidly gaining momentum in education, and organizations like 2Revolutions and Transcend Education partner with schools to support short-cycle learning and design processes. Increasingly, leaders of successful models (e.g., Summit Public Schools and Valor Academies) are making the tools and resources they develop through design processes accessible to the public. More work must be done to support these budding efforts and invest in the research and development that will enable schools to take advantage of new approaches.

   Of course, breakthrough models are likely to go against the grain and run up against the reality that states and school districts have not been organized to support these types of learning experiences. With that in mind, any effort to invest in 21st century learning models must be forthright about what types of flexibilities and supports will be necessary to ensure the approach can take root.

4. **Build a talent pipeline for 21st century teachers and leaders.** Developing pipelines that prepare teachers and leaders to offer 21st century learning is an important lever for building fieldwide capacity. Without well-prepared adults to guide students through unfamiliar expectations and learning structures, it is unlikely that students will thrive in these environments. Encouragingly, some 21st century learning networks have already established pipelines to address this need. For example, High Tech High and Aspire Public Schools both have teacher residency programs (High Tech High also has a fully credentialed Graduate School of Education). Summit Public Schools has also recently decided to establish its own in-house training program.

   But developing teacher and leader capacity does not require every school or network to create its own educator training program. In Lake County, Florida, for example, the district created micro-credentialing pathways for teachers interested in building capacity to deliver 21st century learning. District human resource departments can build cohorts of educators who are prepared to offer 21st century learning and ensure that educators interested in these approaches have the opportunity to work in an environment with like-minded peers. In some districts, this will require districts to make modifications to human resource policies like last-in-first-out and involuntary transfers that have long acted as obstacles to building like-minded staffs.

5. **Align assessment and accountability systems to 21st century goals.** State and district assessment and accountability systems are important tools for identifying inequities and monitoring improvement. But if these systems are misaligned to the goals that educators and education

leaders have for students, they can send contradictory messages and incentivize teachers to limit some students' access to 21st century learning experiences. States and districts that embrace 21st century education should think hard about the outcomes they hope their students will achieve and how their assessment and accountability systems support or resist these goals. New Hampshire launched a new assessment system to support 21st century learning.[26] But as state leaders roll out new assessment systems, they should be mindful of challenges that have been the undoing of previous efforts, including high costs and difficulties establishing valid and reliable assessments.[27] Districts could consider coordinating work on assessment or joining efforts like Edleader21, a professional learning community for districts interested in pursuing 21st century learning.

6. **Leverage "outside" opportunities for 21st century learning.** The schools we observed all sought to reimagine school from top to bottom. But, as Mehta discusses, this work is made challenging by the many countervailing pressures educators face, including test-based accountability and rigid pacing guides. Short of addressing the many challenges that stand in the way of greater schoolwide access to 21st century learning, system leaders could work to expand access to such experiences through "outside" opportunities—e.g., electives, extracurriculars, and summer learning. Focusing on these types of 21st century learning experiences will not resolve all the challenges we have detailed here, but it would provide at-risk students new opportunities to access 21st century learning.

Conclusions from years of research on instructional effectiveness do not equivocate on the conditions that allow students—all students—to thrive. Students learn best when information is relevant and academically accessible, as it is designed to be in 21st century learning environments. But in practice, preexisting conditions can challenge ambitions for this approach and expose students who lack critical skills to learning experiences that compromise rigor and clarity. The implications we suggest require sustained effort from policymakers, funders, and practitioners, but are critical to resolve if the students furthest from opportunity are to be prepared to meet the demands of the 21st century.

Endnotes

1. See Jal Mehta, June 30, 2014, "Deeper Learning Has a Race Problem," *Education Week*, June 20, 2014. Little systematic evidence exists on which types of students have access to 21st century learning. Tracking access is made difficult by the fact that the field lacks a comprehensive list of schools pursuing such approaches. Even when schools pursuing 21st century learning can be reliably identified, gaps in implementation can limit students' opportunities under these approaches.

2. Recent research on child development identifies 16 behaviors, mindsets, and dispositions that help students succeed in self-directed learning environments. These "social-emotional skills" include but are not limited to: self-regulation, growth mindset, resilience, and curiosity. See K. Brooke Stafford-Brizard, *Building Blocks for Learning: A Framework for Comprehensive Student Development* (New York, NY: Turnaround for Children, 2016).

3. See "Deeper Learning Competencies" (2013), Hewlett Foundation website (accessed August 9, 2018); and Jobs for the Future, *Putting Students at the Center: A Reference Guide* (Quincy, MA: Nellie Mae Education Foundation, 2014).

4. Ibid.

5. Stafford-Brizard, *Building Blocks for Learning*; and *Science of Learning and Development*, working paper (Washington, DC: American Institute for Research, Education Counsel, 2017).

6. Jal Mehta and Sarah Fine, "How We Got Here: The Imperative for Deeper Learning" in *Rethinking Readiness: Deeper Learning for College, Work, and Life*, ed. Rafael Heller, Rebecca E. Wolfe, and Adria Steinberg (Cambridge, MA: Harvard Education Press, 2017); Peter B. Dow, *Schoolhouse Politics: Lessons from the Sputnik Era* (Cambridge, MA: Harvard University Press, 1991).

7. Lawrence A. Cremin, *The Transformation of the School: Progressivism in American Education 1876-1957* (New York, NY: Alfred A. Knopf, 1961): 326.

8. Mehta and Fine, "How We Got Here: The Imperative for Deeper Learning," 26.

9. Gary W. Evans and Jennifer Rosenbaum, "Self-Regulation and the Income-Achievement Gap," *Early Childhood Research Quarterly* 23, no. 4 (October 2018): 504-514; Annette Lareau, *Unequal Childhoods: Class, Race, and Family Life* (Berkeley, CA: University of California Press, 2003).

10. Based on author comparison of student enrollments by free and reduced-price lunch in participating networks and a national comparison sample.

11. Betheny Gross, Sivan Tuchman, and Susan Patrick, *A National Landscape Scan of Personalized Learning in K–12 Education in the United States* (Vienna, VA: iNACOL, 2018).

12. See *District Accountability Handbook, Version 7.0* (Denver, CO: Colorado Department of Education, 2017); General Statutes of Connecticut, Volume 3, Title 10: Education and Culture, Chapter 170, "Section 10-221. Boards of education to prescribe rules, policies and procedures," Connecticut General Assembly website, accessed September 5, 2018.

13. Although some may see differences between personalized learning and 21st century learning approaches, we observe far more differences within schools that use these umbrella terms than between them. Broadly, both sets of schools aim to prepare students for college and career in the 21st century by offering flexible learning approaches that meet students' unique needs.

14. See Mehta and Fine, "How We Got Here."

15. Stafford-Brizard, *Building Blocks for Learning*.

16. Evans and Rosenbaum, "Self-Regulation and the Income-Achievement Gap."

17. Lareau, *Unequal Childhoods: Class, Race, and Family Life*.

18. Selcuk R. Sirin, "Socioeconomic Status and Academic Achievement: A Meta-Analytic Review of Research," Review of Education Research 75, no. 3 (September 2005): 417-453; "The Condition of Education: Reading Performance," Institute of Education Sciences, National Center for Education Statistics, last updated May 2018.

19. Dan Goldhaber, Lesley Lavery, and Roddy Theobald, "Uneven Playing Field? Assessing the Teacher Quality Gap Between Advantaged and Disadvantaged Students," *Educational Researcher* 44, no. 5 (June 2015): 293-307.

20. Nicole S. Simon and Susan Moore Johnson, Teacher Turnover in High Poverty Schools: What We Know and Can Do," *Teachers College Record* 117, no. 3 (2015): 1-36.

21. Charles A. O'Reilly III and Michael L. Tushman, "The Ambidextrous Organization," *Harvard Business Review* 82, no. 4 (April 2004): 74-81.

22. A recent RAND report similarly recommends that systems using 21st century learning consider how their approach aligns with accountability systems. See John F. Pane et al., *Informing Progress: Insights on Personalized Learning Implementation and Effects* (Santa Monica, CA: RAND Corporation, 2017).

23. See Douglas C. Englebart, "Improving Our Ability to Improve: A Call for Investment in a New Future" (presentation at the IBM Co-Evolution Symposium, San Jose, CA, September 24, 2003); Anthony S. Bryk, Louis Gomez, and Alicia Grunow, *Getting Ideas Into Action: Building Networked Improvement Communities in Education* (Stanford, CA: Carnegie Foundation for the Advancement of Teaching, 2011).

24. See Pedro Noguera, Linda Darling-Hammond, and Diane Friedlaender, "Equal Opportunity for Deeper Learning" in *Rethinking Readiness: Deeper Learning for College, Work, and Life*, ed. Rafael Heller, Rebecca E. Wolfe, and Adria Steinberg (Cambridge, MA: Harvard Education Press, 2017): 81-104; and Mehta and Fine, "How We Got Here" in *Rethinking Readiness*.

25. Jal Mehta and Sarah Fine, *In Search of Deeper Learning: Inside the Effort to Remake the American High School* (Cambridge, MA: Harvard University Press, forthcoming).

26. Susan Patrick et al., *Promising State Policies for Personalized Learning* (Vienna, VA: International Association for K–12 Online Learning [iNACOL], 2016).

27. National Research Council, ***Best Practices for State Assessment Systems, Part 1: Summary of a Workshop*** (Washington, DC: The National Academies Press, 2010).