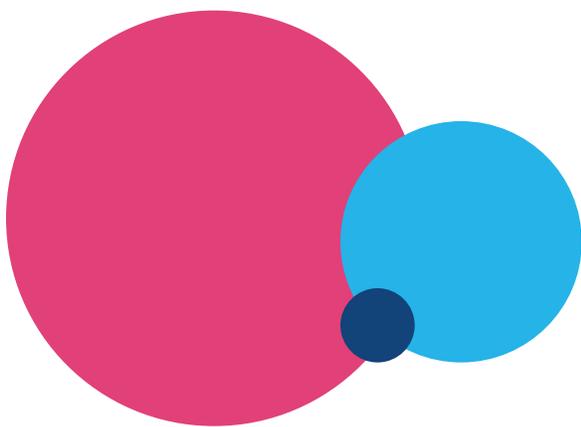


# From Sight to Vision:

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## How Data Can Contribute to Personalization and Preparedness in K-12 Education

By Evo Popoff and Liz Cohen  
Foreword by Jean-Claude Brizard



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# Foreword

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The power and peril of children in technology has been at the forefront of our consciousness for the past year, as the shift to remote learning made parents de facto IT coordinators. And with each new invention or advance, from **voice technology** to **virtual reality**, we see headlines about their applications in our classrooms.

Receiving less fanfare, however, is the work taking place behind the scenes with data systems, which hold the power to revolutionize teaching and learning. These breakthroughs are actually what enable us to make those changes. It has only been recently that reality has caught up to the vision.

To be fair, this has happened before. In fact, data-driven decision-making has been an on-again, off-again theme in education for nearly two decades. But what has changed is the sheer power of modern-day data systems, particularly when in the hands of educators in school systems with strong data cultures. Today's systems provide a wealth of information about our students, far beyond one-dimensional performance on assessments. And that information can help us better understand the full education journey each child takes across a range of learning environments: in the home, the school, the community.

This was particularly important during the past year as schools and districts, in response to COVID-19, had to pivot to discover

what resources their students needed – and in some cases, pivot to change the entire structure of K-12 education. In the process, it became all the more obvious that our students simply aren't served by the one-size-fits-all approach to learning so prevalent in our schools.

But advances in learning science are promoting a concept already known to most parents and teachers: looking at every learner as an individual. In ***The End of Average***, former Harvard University professor Todd Rose argues that every learner varies across many dimensions – executive function, emotional regulation, primary language and mental health among them. Nobody is average across every dimension, he concludes, and these differences impact how we best learn.

As noted in Rose's research and numerous other studies, education involves the integrated, dynamic and individual nature of human development. If this sounds complex, that's because it is. Every student brings life experiences with them to school – relationships and experiences, triumphs and traumas, strengths and challenges. And every single set is unique. Which is why learning and developmental science consistently **identifies** strong, positive relationships between students and their teachers as the single most important factor in supporting learning. And this, perhaps, is where today's data systems hold the most promise for

education. By providing a more complete picture of our students, one that allows educators and administrators to actually see them as individuals, we have the potential to transform education. Being able to see our students in this way is the **first step** in designing a new, more equitable education system.

It's also the foundation for creating a system that personalizes learning in the broadest sense, addressing students' social-emotional needs, unleashing their voices and, yes, supporting their individual academic goals. What better way to create

that powerful emotional connection between student and educator, which is **undeniably** the most powerful driver of a child's ability to learn?

We are just at the dawn of this new era in education, and data are the keys to this future. The stories in this report spotlight work in districts across the country to address challenges both chronic and new, as educators endeavor to leverage data to see the whole child, not just pieces of them.

And most encouragingly, the stories hint at a broader promise that's yet to come.

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#### **About Jean-Claude Brizard**



*Jean-Claude Brizard is President and CEO of Digital Promise, a global, nonpartisan, nonprofit organizations focused on accelerating innovation in education. He is the former Senior Advisor and Deputy Director in U.S. Programs at the Bill and Melinda Gates Foundation, where he focused on PK-16 education across five communities in four states. He is also the former Chief Executive of Chicago Public Schools. Prior to his appointment in Chicago, he was Superintendent of Schools for the Rochester City School District in New York. Under Mr. Brizard's leadership, both the Chicago Public Schools and the Rochester City School District saw substantial improvements in student performance. Mr. Brizard is a Fellow of the Broad Center, a Fellow of the Pahara-Aspen Institute, and a member of the Aspen Institute Global Leadership Network.*

# Executive Summary

- Schools and districts are collecting more data about their students than ever before, with each piece telling a part of their story. But it doesn't tell the complete story. Understanding the whole child – and providing personalized learning to all students – requires creating a culture that prioritizes connecting disparate data to tell a story.
- In many districts, remote instruction ushered in a new era of personalized learning. It allowed educators to discover a wealth of data beyond test scores that are equally useful in providing targeted support to students and their families, including attendance, engagement and access to digital resources.
- In addition to providing more personalized learning, data can help districts and schools address equity goals created long before the pandemic highlighted these gaps. Through sophisticated mapping programs, for example, educators can identify patterns that provide insights into academic performance, absenteeism, population trends and concentrations of non-native English speakers.
- The key to creating a culture that values data is showing teachers that it holds the power to transform their classrooms and the lives of their students – and isn't just another task for them to perform. And if districts and schools want to use data to support each student, then that data also must be relevant, useful and easy to access.
- This paper profiles four districts and one county agency – in California, Maryland, Texas, and Washington – that are rising to the challenge of harnessing the power of data to see, support and educate the whole child.

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Prior to joining the Department, Mr. Popoff led the development of education technology products and school improvement solutions in collaboration with district and state leaders, and educators.

Before beginning his career in education, Evo practiced law at McDermott, Will & Emery where he worked on labor and employment, antitrust, and general corporate issues. He holds a B.A. in Political Science from the University of Chicago and a J.D. from The George Washington University Law School.

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Liz holds a Master's degree in Public Policy from Georgetown University and a B.A. from the University of Pennsylvania, where she graduated summa cum laude and Phi Beta Kappa.

# Acknowledgements

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- **Shivani Stumpf**, Vice-President of Analytics, PowerSchool

# Introduction

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In March 2020, school buildings across the country went dark, and districts built remote learning programs out of whole cloth. Teachers, as they frequently lament, spent several months, if not a year or more, seeing only their students' faces in little boxes on computer screens.

Their complaint was about more than the limitations of video conferencing. It was a metaphor for their inability to see the whole child. The data systems upon which educators had always relied – math and ELA scores, attendance and graduation rates – proved wholly inadequate in answering questions vital to these new learning environments: how are our students feeling? Are they engaged in their learning? What does each student need to be successful academically? Social-emotionally? Physically?

To be fair, districts have been asking similar questions since the dawn of formal classroom education; indeed, writings from the **early 1900s** ask about what students need to be prepared to absorb the information presented at school. But the last 18 months highlighted why districts must look beyond academic performance data to meet a learner's needs in full. It took a global health crisis, but district and state leaders now understand that data elements from the many factors that support student success – academic, social-emotional, physical, environmental – can broaden the definition of personalization and realize its promise.

Sadly, many schools and districts don't have the systems in place to find answers. Making those connections is important under more normal circumstances, but it's particularly crucial when schools find themselves dealing with crises, such as when the state government in Texas shut down in February due to extreme cold. That, however, is easier said than done in some districts, particularly those that lack data systems and, importantly, data cultures.

"We need to have all the data in one place so we can actually say, 'Your success isn't because of X; we know it's because of Y, or even a combination of X and Y,'" said Amanda Salinas of Klein Independent School District in Spring, Texas. "We don't want to operate on assumptions."

Some districts do have those systems in place, however. They're using the data they collect to transform their classrooms – whether in-person or online – into places where the needs of every student are transparent and customizable. "In an environment as personal as education, maintaining a connection with students remains critically important - particularly as we come out of the recent pandemic," said Dr. Michael J. Martirano, Superintendent of the Howard County Public School System. "We are finding tremendous value in the ways that data dashboards have empowered our educators to quickly tend to the individual needs of their students and engage families in the process."

“Due to the pandemic, state assessments were canceled. This led districts to rely more on local formative data to make instructional decisions, said Heather Richter, Administrator of Continuous Improvement Support with Kern County Superintendent of Schools. “Our hope is the continued use of formative data, in combination with state summative assessments, will support teachers and administrators in responding to the needs of students in real time.”

Districts possess more information now than at any other time in history. The last decade witnessed exponential growth, especially since March 2020, in both districtwide infrastructure and “classroom” edtech. Each new application creates millions of new data points that tell part of a student’s story. Understanding their complete story requires connecting disparate data so teachers and administrators can better know their students.

So as students across the country return to brick-and-mortar classrooms, teachers now know that seeing kids in person again won’t necessarily mean they’re seeing the whole student – not without the systems in place that connect all available data, and not without the data culture that prioritizes it.

This report investigates how forward-thinking districts have leveraged data to see the whole student, and by doing so, have reimagined personalized learning. It explains, through interviews with educators, the benefits of connecting various data points to distill meaning and drive purposeful action. It explores ways that districts and states are addressing the chronic challenges, including long-standing inequities that have only become exacerbated by the pandemic. And finally, it reflects on what it means for districts to be prepared for the unprecedented by knowing the full story of each individual student.

**It took a global health crisis, but district and state leaders now understand that data elements from the many factors that support student success – academic, social-emotional, physical, environmental – can broaden the definition of personalization and realize its promise.**

# A New Wave of Personalization

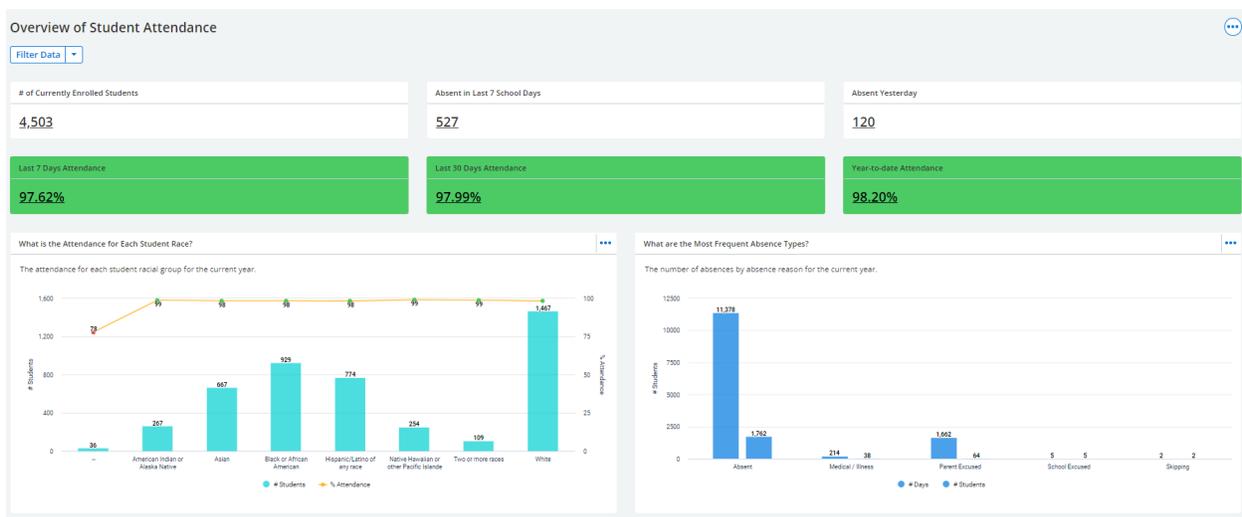
In the era before COVID-19, personalized learning meant adapting teaching methods to fit the needs of each student. By consulting available data – namely, the results of formative assessments – educators could see who was struggling to grasp the material, then tailor instruction accordingly.

But the pandemic spawned a different kind of personalized learning, which began the moment schools closed. As Mary Klyap, Coordinator of Data Literacy and Coaching in Howard County Public Schools in Ellicott City, Maryland, said: “57,000 students got sent home. We needed to make sure that nobody was lost.” Remote instruction helped educators discover an array of data beyond test scores – attendance, engagement, access to digital resources – that are equally useful in providing targeted support to students and their families.

Howard County, for example, used data to personalize learning in the early days of the

pandemic by making note of students who weren’t logging into their remote lessons. The district used multiple approaches to contact students who may not have had reliable access to Wi-Fi, due to either economics or geography.

Once satisfied that all students could access their digital classrooms, the next step was making sure they did, again something easily learned through data. Principals and student services staff, such as counselors and psychologists could use their dashboards to monitor student engagement. They could, for example, sort the information that highlighted the students with lowest attendance, in turn making them a priority for staff, according to Brandy Iskin, the district’s coordinator of data warehouse and reporting. She explained: “At a glance, the classroom teacher, the student services team and the principal could just look and see – who do we need to reach out to? Who’s not going to be fine?”



It was only once those needs were served that the district started using student data in the traditional manner: to measure student academic performance. Yes, that's critical information to have, but it's just one part of the equation, just one way to ensure that students receive truly personalized learning. Imagine how connecting the data points on achievement might inform instruction, such as searching for links between teacher effectiveness and student achievement. In a 2018 **McKinsey & Company report**, one business executive defined the "digital feedback loop" as when an organization can "use the insights, ideas, and innovation generated by the team as an accelerator for improving the capability and service that you provide." Creating a true digital feedback loop in education is an exciting prospect.

Klyap would carry the notion one step further by collaborating with the data warehouse team to create dashboards that encompass less tangible matters like engagement: "If kids have a sense of belonging, that's the underpinning for all the other work that we're trying to do. So what kind of data points might we be able to collect that are related to belonging?"

The good news is that the world of K-12 education is taking note of how data are personalizing learning. Multiple educators have observed increased buy-in from teachers, who realized during remote instruction that data isn't a burden, but something to help address a broader range of student needs. That was obvious by teachers' hunger for it during the period of remote instruction, a time of upheaval, uncertainty and stress, according to one educator.

"Despite being exhausted, despite all the things that we experienced last year, they were still asking for more data, asking for more support and guidance," said Marjorie Martinez of Keller Independent School District in Keller, Texas.

Personalizing the student experience also allows the students themselves to have more autonomy over their own paths. "Learners of today and tomorrow have a story to tell – their own," said Rob Abel, CEO of the IMS Global Learning Consortium. "As school districts gather new types of data, and consider new ways to use those data, we really have an opportunity to redefine how we see each individual learner. We're excited to see districts working to empower students to create and share their story from K-12 to higher education to career."



**Despite being exhausted, despite all the things that we experienced last year, they were still asking for more data, asking for more support and guidance.”**  
- Marjorie Martinez, Keller Independent School District, Keller, Texas

# Using Data to Advance Equity

When districts see each student as an individual with their own needs, aspirations and challenges, then they're positioned to address many of the equity goals that they've been working on for years. In some places, like Howard County, that means developing new data elements to address disparities in disciplinary referrals, which the district is now reframing as "belonging."

In others, it means using positive educational trends to help struggling learners. Take, for instance, Kern County Superintendent of Schools in the San Joaquin Valley of California. The county supports 200,000 students in 47 school districts, ranging from seven to 30,000 students. Kern's data system has been "a force multiplier" for building equity, said Cameron Guinn, administrator of support services.

"We're able to do the things that we've always wanted to do," he said. "The thought process has been there. The equity lens has been there. Now we have the data system to let us do what we've been wanting to do."

"This is reinvention. This is something we never would have dreamed of being able to do with the data we used before."

During the pandemic, Kern discovered that English learners in one district were struggling with remote instruction, said Heather Richter. Kern identifies districts with three years of positive data trends in

order to identify strategies and interventions with the hope of other districts being able to replicate these successes. That process identified a district with similar demographics where English learners were thriving, a connection that would never have been made without the data. Peter Rivera, education program officer at the Hewlett Foundation and former policy advisor for Los Angeles Unified School District, **recently wrote**, "When visiting a doctor, you often get a diagnosis and your doctors will begin to create a plan for treatment based on that diagnosis. As we begin to think of how we address the learning loss that has happened due to COVID-19, we should think about using student diagnostics to create a learning plan for students."

What's happening at Kern is watching this concept come to life.

Using data to advance equity also means challenging biases, including those held by administrators and educators. That's especially true of disciplinary issues, where people tend to make assumptions about who's causing them. Data, however, often reveal otherwise.

"Administrators or teachers may assume certain characteristics about students who are, for example, chronically absent or under suspension," said Guinn. "But with data available, we can look and see that, no, it's not the kids we assumed."

# Maps: Another Viewpoint

Districts have found another way that data can create personalized instruction: through mapping. During the pandemic, plotting data points on maps helped districts determine who needed internet access and devices – and even decide whether it was safe to reopen schools.

The bottom line: maps, like all data, make it harder to delay decisions, since they make facts harder to ignore. “If you don’t have that data, you can kick the can until next year,” said Cameron Guinn. “With the data, you feel like you have to act.”

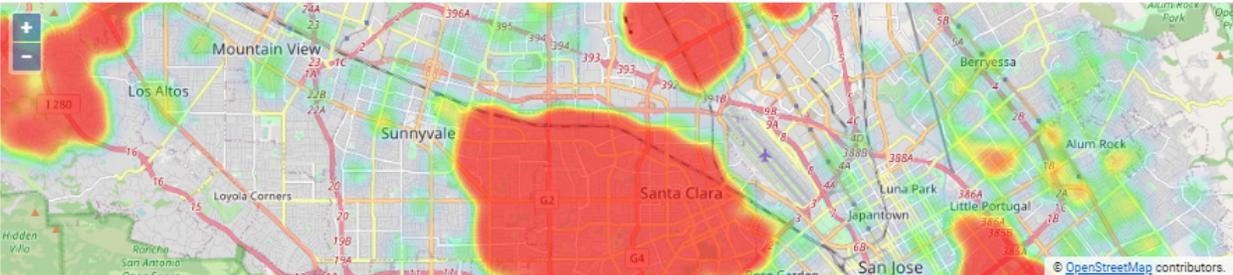
At the start of remote instruction, for example, administrators in Kern County used data to make a heat map of socio-economically disadvantaged communities within the county. They used the information to inform their deployment of

**Using data to advance equity also means challenging biases, including those held by administrators and educators. That’s especially true of disciplinary issues, where people tend to make assumptions about who’s causing them.**

### Where are our serviced students?



The location of the agency and serviced student population.



Example of a heat map showing groupings of student residences by color.

wifi hotspots. Later, after one district noted chronic absenteeism among low-income Black male students, the district created another map to find where they lived – primarily in one community.

“We were able to look at a map and send a van to a specific apartment complex,” said Heather Richter. “We got those kids to school.”

Likewise, Klein ISD also mapped where its students lived to discover population concentrations and access to wifi. But Klein also mapped where its teachers lived, information that will serve the district well as the southeastern Texas community weathers storms, floods, hurricanes – and even deep freezes.

“We used it during the freeze in Texas (in February 2021), so we could see where they

lived to make a decision on whether we should be closed,” said Amanda Salinas. “We didn’t want staff to be traveling.”

Some districts are beginning to use maps for planning purposes as well. As Kern County considers building parent resource centers, particularly in areas with high concentrations of Spanish-speakers, heat maps will help inform decisions, according to Richter. Maps can also help districts identify population trends, including areas ripe for growth. That helps districts determine whether they need to add more teachers, provide additional classrooms or even build new schools.

“Being able to, six months out, appropriately staff for the needs of students – not just guessing what they’ll be – is huge,” said Cameron Guinn. “It’s a game-changer.”



**This is reinvention. This is something we never would have dreamed of being able to do with the data we used before.”**

**- Dr. Cameron Guinn, Kern County Superintendent of Schools, Kern County, CA**

# Building a Data Culture

To create a district with a true “data culture,” all employees must believe that data are essential to achieving the district’s goals. Administrators, teachers and staff not only trust data, but accept that it’s the key to providing personalized instruction.

In Bellevue School District in Bellevue, Washington, that starts with Tom Duenwald, the director of education technology who led the creation of internal videos explaining the importance of data and why the system operates a data warehouse. Duenwald explained that while “Bellevue has been a data-focused district for a long time, our challenge continues to be to meet the needs of students who are traditionally underserved and underrepresented. Our data culture focuses on engagement – meeting educators and staff where they are but also pushing them to think about how they can make better, more timely decisions.”

In Howard County, data culture means helping educators understand that referencing data isn’t just one more administrative task they’re required to do, but something that holds the power to transform their classrooms and the lives of their students. “We tell staff again and again that their jobs are hard enough; we don’t want data to be the barrier,” said Mary Klyap. “Their passion is really meeting the instructional needs of the kids and we are able to do that by looking at multiple data points. It’s not about compliance, it’s about collaborating with teachers to help them help students.”

Making the data relevant to everyone is also part of the process. It requires understanding what teachers, school leaders and other staff need in terms of resources and support. In other words, building a data culture means having to “see” the school and

**In Howard County, data culture means helping educators understand that referencing data isn’t just one more administrative task they’re required to do, but something that holds the power to transform their classrooms and the lives of their students.**

district staff, and supporting them where they are to get everyone where you want to go. Renowned management consultant Peter Drucker is famous for saying “culture eats strategy for breakfast.” While districts are often pushed to develop strategies, perhaps what’s more important is a deeper focus on creating a culture of data use – that digital feedback loop.

“Often, users have an idea of what they’re looking for but don’t have the full requirements or don’t know exactly how to ask,” said Brandy Iskin, Howard County’s data coordinator. “We try to allow them to give more of an idea, and then give feedback on that idea. We tell them nothing is set in stone.”

Like Howard County, Bellevue is focused on creating structures that will set educators up for success. Duenwald, a former educator himself, shared that Bellevue is launching a needs assessment for data focused specifically on classroom teachers. “We took teachers who had never contemplated doing

anything virtually to being fully virtual in a week. You need to have patience for implementation, and you need consistent business practices.” In addition to the needs assessment, Bellevue is also putting significant effort into project management to “ensure that everything – the professional development, the branding, the engagement – is all tied back to the original goal of the project,” explained Duenwald.

As educators become more comfortable relying on data, they begin to see how it can allow school districts to personalize instruction, build equity, improve social-emotional development and, most importantly, allow them to see the whole child, not just one piece of them.

“I’m so excited for districts to be able to catalog their own data and have it be something that can transfer,” said Cameron Guinn. “We’re talking about new horizons for data.”

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# Conclusion

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As we move closer to a full-scale return to brick-and-mortar classrooms, the rallying cry among district leaders, teachers, researchers and parents is that we don't want to just "go back" to the way education worked pre-pandemic. But what these stories show is that even before schools went virtual in 2020, some jurisdictions were committed to redefining the use of data to support each student. As noted by Thomas Murray, author of *Personal & Authentic* and director of innovation at Future Ready Schools, while the realization that data are critical to successful personalization isn't new, the lived experience of the pandemic and the influx of new technology and infrastructure have made the connection even more important: "From the beginning, data and privacy have made up one of the gears in the Future Ready Schools Framework; but without good data systems and data cultures in place educators and administrators simply won't get a good ROI – return on instruction – from the massive investments they've made in the past year on devices and software."

The pandemic showed us not only the power of harnessing data to individualize education, but how that process can open doors for teachers looking to make learning more personal for all of their students. According

to Joseph South, the chief learning officer for the International Society for Technology in Education (ISTE), "the time is now to create edtech solutions for the whole child. We need to fundamentally reframe how we think about the role of technology in learning in light of developmental and learning science."

To make that happen, we must view data in the proper context – as an arrow that points us to the resources they need. It's what Jennifer Bell-Ellwanger, president of the Data Quality Campaign, meant when she declared that "**the data moment has arrived.**" She said "it's time to pivot from tinkering around the margins on data to thinking big about how to begin to use new information and tools to solve the nation's most complex and vexing problems."

The stories in this report serve as a roadmap for districts looking to build the kind of data culture and student supports that Bell-Ellwanger and other educators envision. They also demonstrate that we're just beginning to use the transformative power of data to personalize learning in areas beyond those that address a student's academic needs. We're on the cusp of a new era in education, one that harnesses the power of data to finally see the whole child.