SCHEDULING FOR IMPACT

How Schools and Districts are Unlocking the Potential of the Master Schedule to Make Data-Driven Decisions and Close Equity Gaps

By Adam Pisoni and Sarah K. Silverman, Ph.D.

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Foreword by Steven Gering, Ed.D.

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FOREWORD
Leading Around the Master Schedule

For many years during my career as a high school assistant principal and principal, I viewed the creation of the master schedule as a task to complete. My primary goals when creating a master schedule centered on the following:

- Having all students in class on the first day of school;
- Getting the majority of students the courses they requested;
- Minimizing work required from counselors and other staff members to build the schedule;
- Satisfying the majority of teachers with their teaching assignments;
- Balancing courses to maximize facilities, staff, and resources.

All of these are worthy goals to keep in mind, and paying attention to technical aspects of scheduling are indeed important. For example, it is critical to not schedule more courses than there are rooms available in the facility.

About ten years into my career as an administrator, I had an epiphany about master scheduling. I finally realized that the master schedule was not a technical task to complete; it was the most important tool that was available to accomplish our goals. I shifted from getting students into courses to having a point of view on the master schedule. At this point, I understood that it was okay to have a point of view and goals around the master schedule, such as:

- Trying to shift more students into advanced courses and pathways;
- Eliminating courses from the master schedule that were not preparing students for post-secondary;
- Actively trying to get more students to enroll in four years of math and science, advanced world languages, and high quality CTE and art courses.

Looking back on this epiphany at that pivotal point in my career, I call this concept "Leading Around the Master Schedule." The work around the master schedule changed from a seasonal event (registration and master schedule creation) to a year-round process where we were constantly evaluating our courses, intentionally adding new advanced courses and pathways to our master schedule, finding ways to build pipelines of students into these courses, developing methods to support students in these new advanced courses, and engaging in intentional recruitment of students into our advanced course offerings to ensure that the demographics of these courses reflected the diversity of our student body.

Today, I'm not alone in this epiphany: a growing number of schools and districts have realized that reexamining the master schedule holds profound potential. Leaders are recognizing that, as the "blueprint" for schools, master schedules should reflect a school district's values and priorities. They have found that the digitization of nearly every facet of school operations can transform the Rubik's cube of scheduling from a necessary tactic into a

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far more strategic process.

A process once dominated by clunky SIS tools, magnet boards and sticky notes is giving way to a far more dynamic process, which enables school leaders to experiment with new bell schedules and simulate the implications of new courses and pathways. District leaders now have access to data that enables them to understand how scheduling affects resource allocation. They can understand and evaluate tradeoffs in the schedule that directly affect educators, students—and outcomes.

This paper explains why this transformation around the master schedule is taking place, as well as the pressures that are forcing districts to think differently. It shows that while the use of time in schools is a perennial issue for many, it does not have to be. Digital trends and tools are allowing district and school leaders to rethink and approach strategic planning and scheduling in new ways that have cascading benefits for their priorities and goals. These tools allows leaders to truly "Lead Around the Master Schedule" in order to accomplish the goals outlined in their strategic plans. The vignettes at the end of this paper include the perspectives and experiences from district and school leaders who have tapped the hidden potential of the master schedule, and they show you how you can too.

Dr. Steven Gering

Dr. Gering is a veteran educator, and former Chief Academic Officer for Spokane Public Schools. During his service in school districts, he was an award-winning principal, received the Golden Apple Award in Washington State, and presented at local and national conferences across the country.

After starting his career as a teacher and coach in Texas, he attended graduate school at Harvard and earned his doctorate from the University of Washington. He is currently a member of the School Success Team at Abl, where he helps district leaders to understand and consider how district decision-making impacts student experiences— and educational equity.

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Adam Pisoni is the founder of Abl Schools, an education company helping schools and districts redesign the student experience through the master schedule. Two and a half decades after dropping out of high school, he returned to the field of education to rethink the structure of school as we know it. His career has been focused on helping organizations become more agile and responsive. Prior to Abl, Adam co-founded Yammer, a social network for businesses, and within four years sold it to Microsoft for about $1.2 billion. He turned his sights to education, with the goal of reducing inequities that make it easier for some students to succeed than others. By providing tools to develop schedules that account for the unique learning needs of students, Adam and Abl are helping to improve educational equity and quality for students.

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Abl helps district leaders implement solutions to improve the student experience by maximizing resource efficiency, optimizing teaching & learning and increasing equity & access. Through a combination of data analysis, coaching, and software that complements the district SIS, Abl assists district and school leaders to align time and resources to their strategic priorities. Learn more at ablschools.com.

Whiteboard Advisors is a social impact agency for education. For more than 15 years, our team of educators, policy wonks, and storytellers has brought an unmatched understanding of the policy landscape to our collaboration with the most transformative organizations and entrepreneurs in education. We're passionate about taking breakthrough ideas to scale to reimagine how we learn, work—and live. Learn more at whiteboardadvisors.com.

EXECUTIVE SUMMARY

New iterations of education policy, building on attempts from previous decades, have ramped up pressure on districts to implement programs that support and respond to an increasingly complex set of priorities—and to the needs of an increasingly diverse population of learners. Federal laws are changing the ways states measure progress and hold schools accountable. Districts are, in turn, charged with implementing a maze of programmatic requirements to close persistent achievement gaps and prepare all students for college and career success.

But the implementation of new programs often forces district leaders to manage costly tradeoffs. Even well-intended state and federal initiatives trigger unintended consequences, diverting resources away from students—or schools—with the greatest need. New course offerings or pathways may inadvertently limit access for certain student groups.

Field research has demonstrated that educational experiences diverge not just across districts, but within individual schools and classrooms.[1] Divergent outcomes reflect differential access to high-quality teachers, courses and supports that together lead to better student learning outcomes. Closing equity gaps presents not just an instructional or curricular challenge; it also presents opportunities to rethink school and district operations.

This paper profiles the experiences of school and district leaders who are working to close equity gaps—and make data-driven decisions about the way they allocate limited resources—by harnessing the potential of an often overlooked lever: the master schedule. Many district leaders understand that the master schedule is where policy meets practice. It determines which students are placed into which classes and how teachers are distributed based upon capability and experience. Scheduling affects course loads that influence teacher retention and the availability of programs and pathways designed to improve college and career readiness, or target interventions at discrete populations of students.

Schools all over the nation are taking the opportunity to do things differently by shifting their view of the master schedule as a sticking point and into something more akin to a change agent.

- **Aurora Hills Middle School** in Colorado is offering a full day weekly for teachers to plan and collaborate, and for students to engage in interdisciplinary learning

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1 *The Opportunity Myth: What Students Can Show Us About How School Is Letting Them Down--and How to Fix It. September 25, 2018. https://tntp.org/assets/documents/TNTP_The-Opportunity-Myth_Web.pdf*
Disparities within: Unequal Spending and Achievement in an Urban School District. Sociology of Education. January 2003. https://www.jstor.org/stable/3090259?seq=1#page_scan_tab_contents; Systematic Sorting: Teacher Characteristics and Class Assignments. Kalogrides et al. American Sociological Association. April 4, 2013. https://www.asanet.org/sites/default/files/savvy/journals/soe/Apr13SOEFeature.pdf;

opportunities.

- **Hampton High School** in Tennessee is increasing participation in workforce development pathways and dual-enrollment initiatives.

- **Upper St. Clair High School** in Pennsylvania is empowering teachers to contribute to the master scheduling process.

- **Hoover High School** in California is ensuring access to high-quality, equitable learning opportunities for all students.

Highlighting practitioner perspectives, this paper explores the forces that are bringing the master schedule to the forefront of district strategy, and how shifts in policy and district data management are transforming scheduling into a strategic, impactful process. It explains how choices about scheduling and resource utilization can trigger unintended tradeoffs, and why the digitization of district data provides education leaders with new tools to address them. It concludes with case studies demonstrating how scheduling can be used to enable—and scale—an array of school and district initiatives, serving as one of a leader's most powerful opportunities for improvement.

When we have the tools to critically examine our assumptions about time in schools, and understand how we actually do have the power to shape it, we can envision new possibilities for the education of our students.

Tim Wagner » Principal of Upper St. Clair High School in Pennsylvania

HOW THINKING ABOUT SCHEDULING HAS EVOLVED

The idea of rethinking the schedule to address gaps in equity and achievement is not new. American public school and district leaders have long thought about how to get the most out of every school day. What began as a focus on seat time, however, has evolved considerably to address alignment between what schools provide and what students really need.

The standards-based education reform movement of the 1980s and 90s established a frame for school reform that still informs today's debates and policies. In 1991, Congress passed the Education Council Act, which sought to direct the work of the new school improvement movement by unpacking the relationship between time and learning in the nation's schools.

The law created a National Education Commission on Time and Learning which was given three years to prepare a report on the matter. In their 1994 final report, they reasserted what many education scholars had said before them: that reform efforts will fail unless we change our view of time and learning. "For the past 150 years, American public schools have held time constant and let learning vary," shared the report. "The boundaries of student growth are defined by schedules for bells, buses, and vacations instead of standards for students and learning."[2]

More recently, efforts at more intentional use of time and scheduling have moved beyond increasing seat time to focus on goals of improving access to advanced and elective coursework, project-based learning, targeting interventions at the right times with the right students, and enhancing teacher planning and collaboration blocks.

"There are ways to recapture or rethink the use of time in schools that hold potential to dramatically improve outcomes. We fight for every minute, and we don't have a very long school year," said Barbara Nemko, Superintendent of Napa County Schools in California. "Time is a critical part of increasing student proficiency and increasing students' ability to do the most important things: think critically, collaborate, solve problems, and be more creative."

Master schedules can now be shaped in a way that provides equitable access to the courses and supports all students need to be successful. For example, a moderate change to an existing schedule might be to incorporate time for counseling or more frequent advisory periods to benefit students having difficulty making the transition to high school. To address transition issues, a high school may provide a multi-day orientation for entering ninth-graders. Some school districts are tackling more aggressive changes to their schedule, with a goal to be more nimble, offer more personalization and flex to the unique demands of each class and student.

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2 *Prisoners of Time." Report of the National Education Commission on Time and Learning. April 1994. https://www2.ed.gov/pubs/PrisonersOfTime/Prisoners.html*

WHY SCHEDULING HAS BECOME A POWERFUL TOOL

Today, school districts are experiencing two shifts that have transformed the scheduling landscape.

The first is a policy imperative for equity that transcends mere lip service and requires, through levers like financial transparency and shifts to major title funding allocations, real changes to the ways that most districts have always done business.

The second is digitized data across almost all domains of district operations, which means there are more data to be taken into account when making critical decisions about how to effectively allocate limited resources. Together, these shifts provide both the impetus to evaluate factors contributing to inequity and the technical capability to do so efficiently and comprehensively.

> There are ways to recapture or rethink the use of time in schools that hold potential to dramatically improve outcomes. We fight for every minute, and we don't have a very long school year. Time is a critical part of increasing student proficiency and increasing students' ability to do the most important things: think critically, collaborate, solve problems, and be more creative.
>
> **Barbara Nemko »**
> Superintendent of Napa County Schools

Because a school's schedule determines how its core resources—time, personnel, even physical spaces—are allocated throughout the day, it is one of the more powerful levers for operationalizing a vision of equity and quality in the student experience.

As the district leaders who contributed to this paper explained, the complexity of running a modern school district hinges on a series of decisions about the allocation of scarce resources, compounded by a maze of local, state, and federal requirements that are sometimes subject to political whims and trendy education reforms. In short, effective scheduling is not just a matter of balancing student needs with teacher availability; it encapsulates the myriad complexities of educating students in general.

Federal Policy Demands Equity

For more than 50 years, the Elementary and Secondary Education Act has provided schools serving at-risk students with supplemental financial resources with the proviso that proper resources reach at-risk students in a timely fashion—in other words, that the right resources get to the right kids at the right time. Lawmakers have used these funds to require state-systems of school accountability, compel improvements in student learning, and ensure that agencies deployed their resources according to identified needs. While the particulars of the law's improvement strategies have come in and out of favor, it has always been a driving force for the improvement of equitable educational opportunities.

When Congress reauthorized the law in 2015 as the Every Student Succeeds Act (ESSA), it reduced the emphasis on narrow academic interventions in favor of increased attention to the many non-academic factors that contribute to student success. This shift recognizes what teachers have known all along: that student learning is far more complex than performance on any assessment of math or reading can demonstrate. Aspects of social-emotional learning, behavioral supports, and school climate are intertwined into student success along with proficiency in core content.

ESSA also increased focus on how districts allocate their resources, and whether they invest their funds into strategies with proven educational benefits. Through a provision described as "financial transparency," the law will now require states and districts to report school-level expenditures on a per-pupil basis for personnel and non-personnel activities across federal, state, and local funding sources.

This school-level information, due by June 2020, will provide unprecedented insight into the distribution of the very resources designed to support educational programming for at-risk students. It will offer a treasure trove of data that, when connected to school performance indicators, can start to answer questions that most school districts have long grappled with. Are schools that serve at-risk students operating with sufficient resources relative to other schools in the district? How disparate are the educational experiences of students in under-resourced schools relative to their more affluent peers? Given the resources, how are students performing?

National data suggest the answers to these questions will unearth more questions. Recent research from the U.S. Department of Education Office of Civil Rights brought the realities of students' disparate experiences to light. Their 2011-2012 Civil Rights Data Collection on College and Career Readiness showed that students of color, those from low-income families, English language learners, and students with mild to moderate disabilities had less access to rigorous core and advanced courses, were underrepresented in gifted and talented programs, and were more likely to be held back than their peers.[3] A 2018 report by TNTP, "The Opportunity Myth," came to a related conclusion. Far too few students — especially students of color — have

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[3] *U.S. Department of Education Office for Civil Rights. Civil Rights Data Collection: Data Snapshot (College and Career Readiness). March 21, 2014. https://www2.ed.gov/about/offices/list/ocr/docs/crdc-college-and-career-readiness-snapshot.pdf.*

regular opportunities to do grade-appropriate work.[4] In some districts, students have spent the equivalent of more than six months of learning time in core subjects on assignments that were not grade-appropriate.

"The master schedule can be a powerful enabler of strategic decision making we're being asked to make in service of students under ESSA. Strategic master schedules should be designed that allow students to identify their passions, have integrated student supports and build essential skills for the future," said Preston Thomas, Oakland Unified School District's Chief Systems and Services Officer. "Building schedules that provide equitable access to the courses students want and need to be college, career, and community ready is a complex process—operationally, and sometimes politically—that district leaders may be wary about wading into."

School and district leaders will be under pressure to match their vision of student success with matters of resource distribution and—given the central role that personnel costs play in overall resource allocations—the impacts of master scheduling decisions will likely be on display.

> The master schedule can be a powerful enabler of strategic decision making we're being asked to make in service of students under ESSA. Building schedules that provide equitable access to the courses students want and need to be college, career, and community ready is a complex process—operationally, and sometimes politically—that district leaders may be wary about wading into.
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> **Preston Thomas >>** Chief Systems and Services Officer in Oakland Unified School District

District Data Have Gone Digital

"With the tech and software that's out there, there's no reason to be running 50 pages of conflict reports to resolve students' schedules," said Marc Heiser, assistant principal of Loveland High School in Loveland, Colorado. "The manual labor to do things right without technology becomes prohibitive. We can build a schedule that makes sure kids have the academic opportunities and support they need, without requiring an excessive amount of our counselors' and administrators' valuable time, which can be better spent elsewhere."

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4 *The Opportunity Myth: What Students Can Show Us About How School Is Letting Them Down--and How to Fix It. September 25, 2018. https://tntp.org/assets/documents/TNTP_The-Opportunity-Myth_Web.pdf.*

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Indeed, the data district and school leaders need to make better informed decisions are no longer trapped in file cabinets and magnet boards; it is available in real time and provides leaders with an unprecedented opportunity to understand and evaluate tradeoffs that directly impact teachers and students.

We let the data show us what the most effective time to schedule a course is, rather than setting the courses and then trying to fit student requests into a predetermined schedule.

Patrick Kelly >> CTE teacher at Hampton High School in Tennessee

As a result, school leaders no longer need to rely on wall-sized whiteboards littered with colored magnets or outmoded, siloed student information systems. Gone are the days of manually moving one student here or a teacher there; of counting, recounting and calling it "good enough." Decades of digitization now present school and district leaders with an opportunity to rethink the operations of schools in ways that not only better serve their teachers and students, but finally put equity at the forefront.

When schools have access to comprehensive data about student schedules and outcomes, they can better see the ways students are being served, and identify opportunities for improvement. Districts can also make previously elusive connections between student data and scheduling decisions to help mitigate a multitude of issues—avoiding situations like a first-year teacher having a class roster with a disproportionately high number of students with special needs.

"We let the data show us what the most effective time to schedule a course is," said Patrick Kelly, of Hampton High School in Tennessee, "rather than setting the courses and then trying to fit student requests into a predetermined schedule."

By aggregating data from multiple sources, leaders can build schedules with a complete picture of student needs—and in turn, produce a holistic approach to equitably educating children and teens.

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# HOW SCHEDULING CAN REVERSE UNINTENDED TRADEOFFS

Some historical approaches to master scheduling have resulted in unintended tradeoffs—that is, they have responded to some problems but, in so doing, created or exacerbated others. Below are three common unintended tradeoffs that school and district leaders are working to reverse using the very tool that created them: changes to master scheduling.

Unintended Tradeoff #1: "Shadow Cohorts" and Tracks

When school leaders do not have the tools and visibility to account for the ripple effects of scheduling decisions, they may unintentionally create cohorts of students along different academic tracks. Choices about when to place certain courses in the master schedule—such as a math intervention block or an AP English course—can determine the teachers and peers students interact with for the rest of the day. Oftentimes, this academic sorting falls along ethnic and socioeconomic lines, and among students who are identified for specific interventions, exacerbating social segregation as well as opportunity and achievement gaps.

"When talking about inequities, the kids who have the most cognitive disabilities are the kids who have a schedule within a schedule; these are the kids who may not get their electives," said Marc Heiser, of Loveland High School in Colorado. And students are beholden to that— even when, sometimes, it means repeating an elective class they have taken before, simply because they cannot go anywhere else. "These kids can be self-contained within the core classes and life skills classes," Heiser said, "hindering their exposure to and interactions with peers without disabilities and rigorous electives they are interested in."

9th Grade Student Schedule Tracking
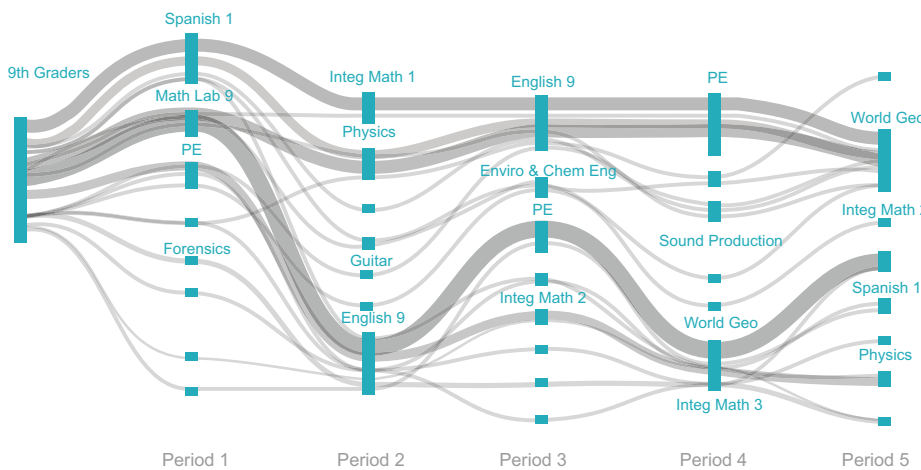
Scheduling decisions may unintentionally create "shadow cohorts" of students, moving together throughout the day along different academic tracks.

Heiser describes a challenge that reflects the fact that scheduling typically starts with questions about teacher capacity rather than student needs: how can we arrange classes so a special education teacher can support a small number of general education courses—while maximizing students' access to requested electives? But it is a phenomenon that presents itself across a range of contexts within schools and districts. From AP courses to electives, school and district leaders often grapple with the unintended consequences of scheduling because the implications of scheduling choices have been so challenging to discern.

"For project-based learning, it's helpful for a similar group of students to travel together throughout the school day in their content courses and their electives," said Diane Conti, vice principal of Hoover High School in San Diego Unified School District, which implements Linked Learning pathways. "But, this runs the risk of tracking students based on their math levels and whether or not they're in an advanced class. Hoover set a goal to 'de-track' 9th grade, because it's important to us for students to be learning with multi-abled peers." Conti's goal is attainable, but it first required an awareness of the issue and a subsequent commitment to finding a way to solving it.

Unintended Tradeoff #2: The Pathways Paradox

A growing number of districts are implementing pathways programs to increase college readiness and career relevance in the high school years and to boost student engagement by allowing for greater choice and alignment with their interests. In worst case scenarios, however, pathways can become limiting—an option handed to (or taken from) students, based on their perceived skill level or past academic experience, rather than a full, well-rounded look at their potential and future career interests.

"There are some unintended consequences if you prioritize your advanced or accelerated pathways," said Christina Casillas, Instructional Support Officer for San Diego Unified School District and former principal at Roosevelt International Middle School. "Other students may not have access to those high academic and accelerated classes." And worse, students who might have the potential for advanced courses or a career pathway simply might not know, or feel they do not have the support to pursue it. While many administrators have observed that not all students progress within their pathways in precisely the intended fashion, many feel that their hands are tied to respond to the needs that students demonstrate along the way.

"Are the only kids getting into advanced courses the kids who've asked to go into AP?" reflected Cheryl Hibbeln, Executive Director of School Innovation for San Diego Unified School District. "If students aren't ready for advanced studies, what are we building in the master schedule to close those gaps so that they can get into advanced studies?" Hibbeln has seen how putting students into classes based on what they can't do, instead of what they could do with additional supports built in, has a lasting impact on the rest of their high school academic journey—and might determine their acceptance into a four-year college.

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Specialized programs and pathways, including career and technical education and dual enrollment with local colleges, have great potential to engage and challenge students. It's important to build a schedule that creates the time and space for these opportunities—through a scheduling process that ensures students have equitable access to the learning experiences aligned with their needs as well as their interests and aspirations.

"For many kids, these electives and interest-based classes are the stilts that keep them invested in high school for four years," said Jason Medlin, principal of the Academy of Richmond County High School in Augusta, Georgia, where about 97% of students come from low socioeconomic backgrounds. "Teachers want kids in their class that have elected to be there. Students want to be in the classes they've chosen. We can increase the chances of kids being successful in their classes if they are aligned with their interests and career aspirations."

Unintended Tradeoff #3: Teacher Mismatch

In some districts, staffing decisions are driven by seniority of educators rather than identified needs of students. While that strategy may seem like a negative reflection on teachers, it is more a feature of traditional ways of doing business than educator demand. As one report noted, school leaders who want to retain great talent have limited levers at their disposal, so offering educators "better" teaching assignments is often used as a retention tool.[5]

Historically, the longer you've been a teacher, the more experience you have and the more likely you are to get higher-achieving kids, when really, we need the most experienced teachers to teach the highest-need students.

Cheryl Hibbeln >> Executive Director of School Innovation in San Diego Unified School District

5 Power Play? Teacher Characteristics and Class Assignments. Washington, DC: CALDER/The Urban Institute 2011. https://www.urban.org/sites/default/files/publication/26956/1001530-Power-Play-Teacher-Characteristics-and-Class-Assignments.PDF

"Historically, the longer you've been a teacher, the more experience you have and the more likely you are to get higher-achieving kids," said Hibbeln. "When really, we need the most experienced teachers to teach the highest-need students."

Scheduling decisions in themselves may ultimately be a smarter retention tool that both provides appealing schedules for educators—for example, with additional time for planning and collaboration—while prioritizing student needs.

Creating class rosters with many high-need students, without appropriate staff support, can not only overly burden teachers, but also create unproductive learning environments for students. On the flip side of this are master schedules that result in some of the least experienced teachers with the largest classes of high-need students.

While these consequences are evident in many schools today, they can be mitigated and avoided entirely through an intentional plan for school operations that holds equity at its core. "When you really build a master schedule around student needs, it truly can provide students with the opportunity for success," Casillas said. "We really can tailor the academic program and instructional schedule so that students are prepared for high school and beyond." Leaders can distribute students of varying needs, or they can maximize staff supports to manage especially challenging student groups through extra support or more sections of the same course.

HOW LEADERS ARE HARNESSING THE POWER OF SCHEDULING

School districts across the nation have proclaimed their commitment to facilitating student readiness for college and careers, but programs designed to improve college and career readiness for students simply cannot be implemented or measured without leveraging the master schedule. College and career readiness hinges on access to rigorous preparatory courses—but offering courses isn't the same as ensuring access for all students by avoiding schedule conflicts, and ensuring students have taken the necessary prerequisites on time.

Advancements in technology and software can help schools implement innovative, flexible master scheduling strategies to personalize teaching and learning. Perhaps most important, however, is the ability to address inequities in scheduling that negatively impact the most marginalized of students.

Trevor Greene >> Superintendent of Yakima School District in Washington State

Seemingly small differences in scheduling can result in widely disparate outcomes for students with real-world academic implications. Students in a district may experience significant variance in instructional time across, and potentially within, schools. Imbalanced teaching loads can lead to variability in class-sizes. Students may have different opportunities to achieve due to inequitable access to rigorous preparatory courses or the supports necessary for students to be successful in those courses.

Clearing scheduling conflicts, balancing teaching loads, and assessing course offerings are the first steps to addressing these issues. In addition, ensuring that students have the opportunity to participate in the necessary prerequisites is key to making readiness a reality. School leaders can create support structures for students to succeed in advanced pathways—structures such as Summer Bridge, Tutoring/"AP Cafes," and double-blocking or other scheduling approaches. Schools can monitor student enrollment in advanced pathways to

ensure they reflect the composition of the student body, and advertise and recruit students based on teacher recommendation, test scores, and other indicators.

"We must pursue bold and creative programming, and we need to be able to effectively implement proven and sustainable programs. Fortunately, there are now even more tools available to address and support the implementation of supportive structures," said Trevor Greene, Superintendent of Yakima School District in Washington State. "Advancements in technology and software can help schools implement innovative, flexible master scheduling strategies to personalize teaching and learning. Perhaps most important, however, is the ability to address inequities in scheduling that negatively impact the most marginalized of students."

Here are four stories of schools and districts that harnessed the power of master scheduling to improve student experiences and outcomes.

Aurora Hills Middle School
Aurora, Colorado

Key takeaways to apply in your school or district:

- Perform an audit of school schedules across the district to inform decisions about how to reallocate resources.
- Consider innovative approaches to carve out more teacher prep and collaboration time and incorporate interdisciplinary studies for students.
- Ensure you obtain the buy-in from staff and students to inform where to make changes to the schedule.

Imagine giving teachers a full day of planning and collaboration time—including professional development—every week. Teachers would get access to a full day, every week, for planning without any additional costs for substitutes and without losing any learning or instructional time for students.

This is exactly what administrators do at Aurora Hills Middle School. And they do it through a strategic allocation of resources and time.

"With our new flexible schedule, which we were able to implement at no additional cost, we are able to put a much greater emphasis on cross-curricular learning and increase student engagement via enriching new 'plus' programs," said Marcella Garcia, principal of Aurora Hills Middle School, located in a suburb outside of Denver, Colorado.

It all started with a districtwide audit of master schedules across Aurora Public Schools that found incredible inconsistencies in how schools used their time. "The big concern was that schedules just weren't equitable across our schools," said Kathleen Shiverdecker, Executive Director of School Success at Aurora Public Schools. "This affected how much time our students were spending with grade-level content; and we wanted to ensure every student has consistent, daily access to grade-level, standards-based content—particularly in the core areas of math and language arts."

The districtwide audit showed that teachers at Aurora Hills had a higher course load than in other district schools, higher-than-average class sizes and less instructional time. So Garcia and her leadership staff, along with the teachers, began to consider different scenarios—looking at the confluence of time structures, staffing, students and instructional goals—and how they impact things like class size, teacher preparation time and overall conditions for instruction and learning.

"It's less about the minutes in a day and more about students' access," said Shiverdecker. "We want every—and when I say every, I mean every—student to have access to honors-level courses."

The end result is a flexible 7-period day that carves out one day per week for teachers to swap strategies and align instruction, while students get to participate in interdisciplinary learning opportunities in STEM, digital literacy and world languages and cultures. Perhaps the biggest change in access has been for those students who require special education and English language learner services; these students also participate in the "plus" day—courses and opportunities they have not had access to in previous master schedules.

The teacher planning days "are focused on creating equitable outcomes for students," Garcia said. During collaboration time, teachers assess student data and plan lessons; they also participate in two hours of job-embedded professional development, saving time and money for both teachers and the school.

The new flexible schedule also affords flexibility for teachers to tag-team instruction, splitting two classes into groups based on their needs—whether they need a little extra help or want to go more in depth.

"None of this would have been possible without teachers being willing to own the process and reimagine how their school worked," Garcia said. As teachers execute the schedule, their buy-in was critical. Garcia worked for the better part of a school year to present the scenarios to teachers—in large and small groups and when necessary, individually—and then to solicit buy-in for crafting a more equitable schedule with more opportunities for students and with more support for teachers. Later, the staff voted on and approved the new, flexible master schedule. And students' interests and demand helped identify the best courses and topics to offer during "plus" days.

"With [teachers'] active involvement, plus the support of parents and a high level of student engagement, we are better positioned to accelerate student learning and achieve the vision that every student shapes a successful future," Garcia said.

Upper St. Clair High School
Upper St. Clair, Pennsylvania

Key takeaways to apply in your school or district:

- Include teachers during every step in the development of the master schedule, not just at the end.

- Survey the staff to uncover better ways to allocate your greatest resource: time. (Checkout the free survey tool at www.unlockingtime.org to gather insights on what your staff thinks about how you use time at your school).

- Carve out time in the schedule for teachers to collaborate, and consider professional learning communities as a way to formalize teacher collaboration.

In most school districts, teachers are left out of any schedule planning processes. Instead, administrators tinker with class assignments, which they base on teachers' credentials and experience, and teachers receive schedules to teach specific courses at specific times—much in the way their students are assigned classes. If teachers have been involved in planning, it has generally been limited to providing their perceptions of student performance and capability.

At Upper St. Clair High School in a suburb of Pittsburgh, Pennsylvania, leaders are flipping the script entirely—inviting teachers to share not only their perceptions, but also their preferences and opinions about how time is used more broadly in the school.

"[This] enables us to understand our experiences and needs as it relates to time—not what the state has mandated we should do with time and not what administrators think are our needs," said Tim Wagner, principal of Upper St. Clair High. He and his colleagues draw on that feedback to facilitate discussion around new strategies and generate new approaches to using time to meet their overall goals.

"This opens dialogue in a way that is inclusive of the entire faculty and helps give voice to our educators, as we consider new time strategies," Wagner said. "This helps with buy-in for any changes we ultimately make, because our staff can see that decisions were informed by their input and experience."

For example, school leaders asked teachers about some of the more obvious ways to address scheduling challenges: how best to create pathways for students and connect them with outside-of-classroom work experiences, and how best to facilitate cross-department collaboration among teachers through established planning times. But there are other, more nuanced challenges in allocating time and resources that Upper St. Clair High leaders also asked teachers to think about: how to allow room for social-emotional learning and development throughout the day, for example, or how to incorporate online and hybrid learning. "All of these things require us to harness the power of time and scheduling," Wagner said.

Upper St. Clair, the only high school in its district, serves more than 1,400 students in 9th through 12th grades. About 85% of students are White, and many students come from affluent families. By collecting the perceptions and experiences of the teachers who live the schedules they create each year, leaders at Upper St. Clair identified ways to use time to reach their strategic goals.

For one, leaders established professional learning communities (PLCs), or opportunities for teachers across departments to collaborate. The effect was cascading, Wagner said, in that it gave the teachers who were craving the planning time the time they wanted; and it demonstrated to other teachers, who were not sure of its necessity, why it mattered. Once the social studies teacher, for example, is in a room with the math teacher, strategizing and troubleshooting lesson plans, challenges and instruction, it is easier to see its utility. PLCs have a rippling impact—from aligned instruction and supports to more cohesive learning experiences for students.

It frees teachers up for creativity, Wagner added, pointing to the accountability era which has made some instruction too test-driven. PLCs provide much-needed collaborative time for teachers in a profession where it is easier than not to spend the entire work day alone in a classroom.

"It can be difficult to even imagine creative and innovative alternatives in schools when people feel so tightly bound by the structures of time," Wagner said. But he pointed out that scheduling can sometimes appear immutable when it is actually a critical lever for change: "When we have the tools to critically examine our assumptions about time in schools, and understand how we actually do have the power to shape it, we can envision new possibilities for the education of our students."

Hampton High School
Hampton, Tennessee

Key takeaways to apply in your school or district:

- Allow students to request courses online, to get early insight into demand and to allow time to analyze their progress towards graduation requirements.

- Incorporate transparency and agency into the scheduling process, exposing the tradeoffs so students can make informed choices.

- Complete the master schedule before students leave for summer, to allow students to be prepared for the year ahead and eliminate chaos in the first week of school.

Like many schools, Hampton High School has more than just its own schedule to worry about. The district must also worry about the schedules of neighboring off-site facilities that offer dual enrollment courses, in addition to those of online providers that offer unique or advanced coursework that can't be easily staffed at the rural school in eastern Tennessee.

The more that leaders at Hampton High can anticipate conflicts, the better they can integrate their operations with the opportunities available to students outside of the classroom to develop their career interests and begin training for the rigor and demands of that work. When there was a push to boost enrollment in career and technical education (CTE) programs at the school, leaders knew the onus was on them.

"The problem was not that students were uninterested in these courses," said Patrick Kelly, a CTE teacher at Hampton High. "Rather, it was very difficult to meet student course requests in these subjects because of limited staffing—for example, we have one auto mechanic teacher, one business teacher, one marketing teacher—and because the courses often conflicted with classes required for graduation."

In Tennessee, students are required to choose an elective focus with three credits for graduation, and one of the easiest ways for a student to achieve that is through the CTE department. Up to 70% of Hampton High students complete their elective requirements through CTE courses, which creates conflicts when there is only one teacher available to lead certain courses.

To help, Hampton High has agreements with other high schools in the county, so Hampton High students can enroll in CTE courses that aren't available at their school and students from neighboring schools can take, for example, auto mechanics or engineering design at Hampton High.

"Having a percentage of the population out of the building and needing time in their schedule for the commute to the other schools added an additional layer to the challenge of master scheduling for CTE courses," Kelly said.

Hampton High leaders started by soliciting student course requests online, which is a benefit for them and students. They get real-time updates and feedback and can see where demands and interests weigh heavily, while students can see how their selections fit in with their course pathways and ultimate plans after graduation. Their online course scheduling program also inherently includes a built-in advising component that visually shows students how and whether their selections fit into their diploma requirements.

This early understanding of course demands and the overall landscape allow administrators the foresight needed to craft course schedules and pathways that meet student requests and best prepare them for life after high school.

"It offered them important information and guidance like, 'you are a senior, so you need to take English 4 or a dual-enrollment English class,' or 'if you want to go to four-year college, you need to have Spanish 1 and Spanish 2,'" Kelly said. "In the past, to get this information to kids, we had to stand up and deliver it in a big group setting. This online course request process was more personalized for students and walked them through an understanding of the scheduling process and choices."

Additionally, by completing this process in the spring—for the upcoming fall—Kelly estimates that 90% of students leave for the summer with next year's schedule in hand. This sets students up for success the following year, giving them the summer for any preparation needed. It also eliminates much of the chaos that encompasses the first few days of school, when students work with counselors to rearrange schedules, allowing teachers to get started immediately on curricula.

After the first year of soliciting student course requests online and using it to drive the schedule rather than fill it, Hampton High increased enrollment in its CTE courses by nearly 30%. "This is great for our students and great for our school overall," Kelly said.

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Hoover High School
San Diego, California

Key takeaways to apply in your school or district:

- If equity is your aim, schedule the students first—then match the teachers.
- While constructing the schedule, consider class sizes, teacher experience, and student needs to create diverse rosters, and ensure support structures are built into the schedule from the beginning.
- Minimize tracking by scheduling rigorous courses at the same time as general education (for example, an Honors-by-Contract practice) or reduce stratification in your course catalog.

When Hoover High School Vice Principal Diane Conti began the process of building a master schedule with a more focused eye toward equity, she found something that troubled her: some of the neediest students—English learners, special education students and other at-risk students in need of academic intervention—were placed more often in larger classes with less experienced teachers.

For example, freshman English was taught by a relatively new teacher in a class with 30 students, while Advanced Placement (AP) Literature had a veteran teacher with 20 students.

Conti also saw that specific subgroups were significantly underrepresented in AP courses, and they tended to be separated from other students throughout the day as a result of the way their intervention blocks were scheduled.

In this way, Hoover High was not leveraging one of its greatest assets: its diversity. One of the largest schools in the San Diego Unified School District, Hoover High prides itself on its English development program (students from neighboring districts attend just for that), small learning communities and project-based approach to instruction. Among the 2,200 students on campus, 17 different languages are represented, and almost one-quarter are enrolled in AP or advanced courses. The vast majority of students—more than 90%—qualify for free and reduced-price lunch, and about 25% are English learners.

"Kids used to come to school to get info, socialize and fulfill custodial needs for parents," Conti said. "Today, school needs to instead offer the opportunity for collaborative interactions and team-building, partnerships with industries, and project-based learning that will prepare students with skills for success in this century."

Armed with that commitment to student-centered learning and data that illustrated where they fell short, Conti and her team built a schedule for the new school year with equity at the core. "We started by talking with the academy directors about what classes we need. We scheduled for kids first and had a lot of conversations and data dives before adding teacher names," Conti said.

They created more balanced class sizes, including making sure that newer teachers were not overloaded with too many large classes full of high-need students. They built more diverse rosters, so that classes included a more balanced ratio of students with special needs, English learners and those in gifted programs. Beyond creating more manageable classrooms for teachers, this also exposed students to richer, more diverse environments. "It's important to us for students to be learning with multi-abled peers," Conti said.

Importantly, the schedule guaranteed common prep and planning time so teachers could meet and discuss the best ways to support students.

In this way, the new schedule gave teachers the space and resources they required to begin addressing inequities, and it gave students the environment they need to be more successful learners. The transformation began immediately. Professional learning communities geared towards instructional practices and student engagement will show even greater transformation, yet adjustments in the schedule gave students a jump start. Ensuring that all students were met with higher expectations—while receiving the support they need to meet those expectations—was a matter of adjusting operations.

CONCLUSION

While the best way to use time in school has probably been on the minds of educators since time immemorial, the practical constraints of managing numerous and competing priorities combined with the expanding role and size of schools has made effective use of the master schedule a perennial challenge. But recent policy imperatives from ESSA and states' own educational commitments combined with increasingly digital—and therefore increasingly accessible—data mean that the opportunity to use time in general and the master schedule in particular as a powerful lever for change has never been greater.

ESSA, passed in 2015 but still in the early phases of implementation, established a true north for education systems nationwide: equitable access to the resources that students, regardless of background, need to be successful in school and beyond. The law aligned eligibility for massive sums of federal dollars with evidence of equitable resource allocation in an effort to help close opportunity and achievement gaps once and for all. States followed suit with plans that were aligned to the law, but also specified in their own terms how they would comply and what metrics they would use to ensure progress.

Many district leaders have carried the mantle of equitable access to resources a step further, and carefully analyzed each of the systems and processes in their schools to evaluate which strategies were supporting—and which were hindering—progress toward the equity imperative. Numerous leaders have observed that the master schedule, a previously overlooked tool, was an untapped resource for large scale improvements to resource allocation and, in turn, students' access to key resources they need to be successful.

The leaders showcased in this paper are cracking open the traditional ways that operations have been handled in schools for decades, and they are unlocking the rich potential of the master schedule to create an equitable learning environment that serves all students.

They have made school operations student-centered, starting first with student needs and requests and crafting time and supports accordingly. They have empowered teachers to give voice to the process that shapes their day-to-day life and classroom makeup. They have increased rigor and the quality of students' learning by expanding access for more students and carving out more collaboration opportunities for teachers.

As a result, they see far more students enroll in advanced coursework and work-based learning pathways—both opportunities that enrich the high school experience and place students on steady footing for college and career. They see more diverse classrooms with manageable sizes and balanced needs that empower teachers to be their absolute best. Most importantly, they speak truth to equity, making it the centerpiece of their school operations.

In the words of Cheryl Hibbeln of San Diego Unified School District: "No matter where kids are in the system, the master schedule needs to help them be all they can be."