Breaking the Mold: Understanding and Developing New School Models

Part One: How might we think about school design?

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Education Elements

Learners of today. Ready for tomorrow.

As we continue to progress through the 21st century we are compelled to ask whether current models of schooling are well designed for the world beyond classroom walls. In particular, it's worth reflecting on 3 essential questions in school model design, a term we use to refer to how schools are organized to deliver instruction to students.

1. Why do we have the school models that we do?

2. Why should we be thinking about change?

3. How might we think about changing school models?

This white paper is meant to provide educators - from teachers and school leaders to school board officials and state policymakers - a sound background on the current state of school design and concrete ideas for making change.

A second white paper in this series will address a set of key principles that should anchor all school design (and redesign) efforts.

About the Author

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1 Why do we have the school models that we do?

The goals of schooling have changed radically in the past 150 years. Consider the notion of literacy. The ability to sign your name made you literate in colonial times; in the 1800s, you'd reach the same designation if you could recite a few memorized lines of the Declaration of Independence. Around the time of World War I, a new demand for literacy from the US Army shifted the definition of literacy to focus on the ability to make sense of technical manuals in new contexts. Today the standard is higher still - students are expected to read for themes, make inferences, argue an author's point of view, and self-direct much of their own learning.[1]

Despite changes in the demands of learning, many of the historical structures of schooling remain stubbornly in place. While many teachers bring more far more creativity than the drab system described below, it's worth reflecting on how static some critical elements of schooling have remained over the years:[2]

> *Structurally, children go to school buildings during predetermined times of the day, week, and year...In school, teachers lead children, who are grouped together by age, through a prescribed curriculum developed by adults with little input from students themselves...A range of subjects is taught in discrete time periods throughout the day—and indeed, in the U.S., for example, subject times have remained more or less stable since 1920. Students rely heavily on teacher instruction, with a particular focus on academic subjects, and they work to actively understand and retain the material presented, while frequently being incentivized to do so via examinations that the teacher administers...Students progress through school based on their performance within predetermined time periods.*

It's important to reflect on whether this system was built to optimize learning or to optimize efficiency. Many of these structures arose out of efforts to bring scientific management techniques to the organization of school systems in the early 20th century.[3] And by the 1960s, the traditional 9-month, 180-day, 6.5 hours/day school calendar had become the norm.[4] We've largely been living with it ever since, and we've often settled on roles, responsibilities, and infrastructure investments that keep key components of the current system in place.

Why has it been so difficult for schools and districts to adapt to changing circumstances and pursue new models of teaching and learning? There is no shortage of constraints that may influence design choices. Consider just a few factors that continue to influence school design and resource allocation within districts.

Funding flows complicate many design decisions

Schools operate on a mix of local, state, and federal dollars, with 40-60% of their budgets stemming from local revenues derived from property taxes - a key element driving financial resources available to schools.[5] While state and federal dollars attempt to offset inequities between high and low wealth districts, categorical programs can also dictate the types of reforms schools pursue. Consider one example - a school looking to extend the school day, create an extra period for project-based learning and academic support, and add new teacher roles to support an updated schedule. A number of hurdles may get in the way:

- Some states provide funding based on hours of instruction, which may hamper efforts to develop class periods that don't align exactly with restrictions.[6]
- Money for an extended day could come from up to 7 sources, from Title I to juvenile justice or school lunch programs.[7]
- Inflexible staffing positions might limit the range of responsibilities a school can design for adults.[8]
- If funding for professional learning was to come from federal sources, 10 agencies administering 82 distinct teacher quality programs might provide essential resources but arrive with unique guidelines.[9]

Add it all up and schools or districts looking to innovate may face outright restrictions or simply a complicated set of options that make a simpler status quo seem more attractive.

Time-based credits remain common educational currency

The rules for the number and types of courses students must take stem from the Carnegie Unit, typically defined as 120 hours of study in a course, with a set number of credits needed to graduate. For example, high school graduates in Washington, D.C. must earn 24 credits, 21.5 of which are mandated by subject area. This system developed from a need to distribute a grant to fund the pensions of university professors, which raised questions of what qualifies as a university, which led to standard metrics of who qualifies as a high school graduate eligible for college.[10] Today, seat-time requirements continue to underpin course scheduling, staffing, and assessment decisions, with some schools looking to waive seat-time mandates through competency-based models that free up more time in some subjects of study or new courses altogether (e.g. if playing on the basketball team counted as a PE credit, students on that team would have more time elsewhere.

Measures of success are often limited to testing data

While specific programs or model designs may have impacts beyond test scores, academic data is still the primary means by which programs are evaluated, potentially limiting the true impact of interventions (as a recent study of 21st Century Community Learning grants found).[11] When desired outcomes are narrow, solutions proposed to meet them are likely to be so as well.

Non-academic services influence academic decisions

Especially in larger districts, changing something as seemingly simple as the start time of a school day has major ramifications on other operations such as transportation or food services. For example, there is evidence of academic gains associated with starting school days later for adolescent students; however, older students typically begin school before elementary school students in order to conserve transportation costs.[12]

State law, school board policy, and workforce agreements set the rules of the game

Where collective bargaining is in place, teaching contracts set boundaries on pay and school schedules that can limit the range of changes pursued by schools.[13] Even in states without collective bargaining, state law can govern teacher evaluation practices, tenure guidelines, and rules for firing teaching staff. The combination of state law, teacher contracts, and local school board policies continues to govern key elements of the teaching profession.[14]

Exempting from certain policies may not be an option

While some states offer pilot opportunities or waivers from existing policies, many offer few pathways for new means of school organization. The pursuit of new models of schooling may be enhanced by creating flexible innovation zones or legislation authorizing new pilots.[15,16]

Culture can sink any redesign effort

Some argue that change efforts introduced into schools with weak communication channels, social tension, and/or low expectations will never take root, no matter the quality of the intervention or resources allocated for implementation.[17] Others have found evidence that the perception of barriers to change outweighs their prevalence - one case study found just 22% of barriers to instructional innovation listed by principals were actually borne out in policy restrictions, and several others have found that teacher contracts often serve as a rationale for inaction rather than hard-coded policy barriers.[18,19]

Going through this list one starts to get a sense of the complex mix of obstacles that may factor into change efforts. It's no wonder that several core trends that have recently reshaped other sectors have eluded the field of education. These include:[20]

- Motivation through collaboration rather than coercion
- Behavior governed by strong relationships and norms rather than rules
- Promotion of learning and self-assessment among workers through information-rich environments rather than relying on supervision of routines
- Structuring work around whole products or services rather than disconnected pieces (in education, this would mean focusing on whole-child success rather than delivery of curriculum and assessments in specific subjects)

Why do we have the school designs that we do?
Next Steps

Over time many of the core elements of our schooling system have developed through a complex interaction of policy choices made at a variety of levels - from local school boards to state and federal policies and workforce arrangements. The result can be systems that simply are not optimized for student learning.

It is worth taking a good, hard look at those systems in your school or district in order to determine where changes can be made and at what levels - some choices can be made locally and almost immediately, others may require collaboration at the state policy level.

1. **Create a Policy Inventory.** Catalogue the key constraints in your system that set the boundaries for the types of design choices you'd like to make.
2. **Ask questions. A lot of them.** Interrogate the rules of the system - know where barriers are real and where are they perceived..
3. **Be ready to test your new ideas.** When making changes, be clear that you intend to show results relative to the current systems that are in place.

2 Why should we be thinking about change?

Beyond a set of systems and design choices layered upon one another from the 20th century, what drives the need for change in the 21st is a new mix of challenges and opportunities brought on by realities within and outside of education. Advances in education research give us ever more important lessons about how to structure learning; technology advances create conditions for new kinds of learning as well as workforce changes; and major questions about the results of our current systems are raised when looking at achievement gaps and college preparation.

We have an increasingly sophisticated understanding of how people learn

In large part due to advances in learning sciences, what we know about how children learn is becoming increasingly sophisticated. From the National Council on Teacher Quality's 6 strategies that all teachers should know to principled guides like The Science of Learning, increased pressure is being applied to teacher prep programs to equip new teachers with pedagogical recommendations derived from the learning sciences.[21,22] And even though debates about the importance of learning facts versus learning concepts continue to roil, it's increasingly clear that high quality, deep learning involves both. For example, Mayer (2010) proposes an integrated network of five types of knowledge critical for performance in novel situations:[23]

- **Facts** - statements about the characteristics or relationships of elements in the universe
- **Concepts** - categories, schemas, models, or principles
- **Procedures** - step-by-step processes
- **Strategies** - general methods
- **Beliefs** about one's own learning

Research suggests, intuitively, that an integrated set of facts and conceptual knowledge are more likely to translate if organized around schemas, models, and general principles.[24] But not to be left out is the critical importance of social emotional underpinnings in how people learn, which would suggest that schools making design decisions through a purely academic lens of how students learn may be overlooking essential skills such as the ability to manage one's emotions and regulate conflict.[25]

The accessibility of information and networks is creating new opportunities to learn

Knowledge is increasingly distributed, accessible, and free, and children have the opportunity to pursue that knowledge and contribute to it more readily than at any point in history. From direct interaction in local communities to online networks that allow connections beyond state and national borders, the opportunity for students to

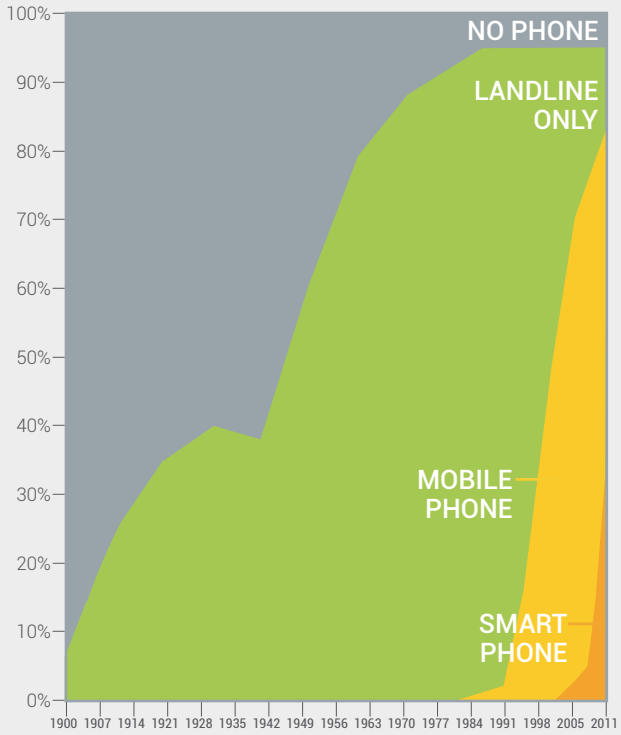
directly engage with different perspectives, wrestle with large ideas, and share their own has never been more prevalent. Seely Brown and Thomas (2011) argue that teaching in the 20th century was often mechanistic, focused almost exclusively on knowledge transmission from teacher to student, while today "learning should be viewed in terms of an environment...where the context in which learning happens, the boundaries that define it, and the students, teachers, and information within it all coexist and shape each other in a mutually reinforcing way."[26]

Technology adoption in areas impacting schools occurs faster now than in the past

While rapid innovations have occurred in the past (e.g. Ford's assembly line in the 1910's took auto assembly times from 12 hours to 1.5; television adoption in the 1950s mirrored smartphone adoption rates today), they may not have impacted students so readily. It took 40 years for the telephone to reach half of American households; smartphones approached that number in just 4 years.[27] And unlike telephones, smartphones have made their way into classrooms as learning and communication devices possessed by students: in 2015, for example, 92% of teenagers reported going online daily, a number partly driven by 73% of teens citing access to a smartphone.[28] Given the amount of time and access students have to technology, schools increasingly find themselves having to help students navigate lessons on research, sourcing, self-regulation, and online relationships.

From No Telephone to Smart Phones

U.S. households by type of phone, 1900-2011



Sources: Forrester, Knowledge Networks, New York Times, Nielsen, Pew, U.S. Census. "No phone" numbers derived by subtraction.

Structural elements of the economy and new workforce possibilities are placing a premium on lifelong learning capabilities

There are major questions being asked of the current education system's ability to meet the demands of the 21st century economy. Technological developments are placing strains on both high and low-skilled workers: for example, while a college degree still predicts major economic benefits, since 2001 the wages of college graduates has taken a hit relative to other groups, and there is some evidence college graduates

are pushing out lower skilled employees in cognitively less demanding tasks.[29]

There is no shortage of documentation on the need for future workers to be able to adapt to changing circumstances. Labor markets are increasingly fluid and global in their reach - in 2015, an estimated 23.9 million people worked as freelancers, contract, temporary, and on-call workers, up 10% from a decade earlier.[30] Five years from now, there are major questions about the skills necessary to perform well at work, where according to one estimate "on average...more than a third of the desired core skill sets of most occupations will be comprised of skills that are not yet considered crucial to the job today."[31] And finally, one report estimates that in about 60% of current jobs, one-third of activities could be automated in the near future.[32]

In the past, businesses themselves would often shoulder the burden of retraining workers. However, the pace of change in the 21st century raises questions about their ability to do so:[33]

When a new technology came along in the workplace once every ten or 20 years, businesses could offer classes, retrain employees, hold seminars, or schedule retreats to bring everyone up to speed. In short, they could create structured, centralized learning tools to help people adapt. With shorter time frames, this has become more difficult.

Significant achievement and opportunity gaps persist across income, racial, and geographical boundaries

In the United States achievement gaps continue to persist both across school districts and within them, the consequence of which is effectively a "permanent national recession", according to one study.[34] Gaps persist along racial lines, where on average black and Latino students trail white students by 2 to 3 grade levels, and white students trail Asian students in test scores and graduation rates from high school and college (with explanations for the latter varying from views on effort to access to better schools).[35,36,37] Differences in performance also occur across income levels, where research has found that sixth graders in low-income districts score 4 grade levels behind wealthier districts on reading and math tests.[38] Gaps can be found across rural and urban divides as well: in rural areas, 17% of adults over the age of 25 have a college degree, roughly half the attainment level of their urban counterparts. However districts define and discuss achievement gaps, thinking deeply about how schools are organized to address them will be a critical component of the conversation.[39]

Large shares of high school graduates attending university require remedial coursework

There is a positive trend in the graduation rate of students nationwide, with roughly 4 out of 5 high school students currently receiving a diploma in 4 years.[40] However, questions remain about how prepared

those graduates are for the workforce and further study: consider that half of undergraduate students in the United States are required to take at least 1 remedial course, a cost equivalent to $7 billion per year.[41] In community colleges, which serve roughly half of America's undergraduate students, the need for remediation is even higher: for example, 80% of community college students in California take remedial coursework in math, English, or both.[42] While there is some evidence that a singular focus on placement tests leads to misassignment of students, the overall trend suggests that many are still ill-equipped to manage the demands of undergraduate learning in their early days on campus.

Why should we think about changing school model designs?

Next Steps

With each passing year educators have access to updated research on factors that influence student learning and new technologies that offer new ways of structuring learning. Meanwhile changes in the structure and opportunities of the workforce demand reflection on how schools are preparing students for life beyond graduation. Given that the current track record of schools at large includes persistent achievement gaps and high numbers of graduates enrolled in remedial coursework, it's worth asking what how we might improve upon school designs.

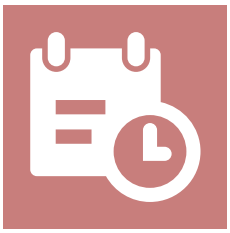
1. **Benchmark your district's core instructional practices against the latest research.** Consider how the components of your primary instructional initiatives align with the latest research from the learning sciences on how students learn.
2. **Understand the workforce outlook in your region.** Work with community partners such as business leaders to understand the skills that jobs in your region demand, and compare that to the skills that are emphasized in your students' coursework.
3. **Know your achievement gaps and establish rigor in all courses.** Review data to understand any persistent gaps in achievement (e.g. test scores) or attainment (e.g. graduation rates) and create an action plan to address them. Compare upper level secondary courses against college-level work requirements in order to assess the level of rigor graduates will have had access to prior to leaving campus.

3 How might we think about changing school designs?

Developing new school models involves thinking conceptually about the type of learning that is desired as well as concretely about a number of variables that shape the school day for teachers and students. This section focuses on many common structural elements of school redesign efforts and the hard choices that accompany them; part 2 of the whitepaper series will identify a set of principles to consider when shaping new school models.

Every day school districts make decisions about when students will be picked up, how long class periods are, how much time teachers have for collaboration, and how large class sizes will be, among other choices. It's worth taking time to reflect on what we do and do not know about these types of decisions before making choices that have potentially large impacts on student learning. An effort is made here to establish some common benchmarks, if available, but the exact numbers in areas like of class size, length of class periods, or hours of collaboration time should be implemented and evaluated for impact by each school or district making changes.

Model design choices are considered in 4 broad categories, with 2-4 elements of each category discussed in detail below:

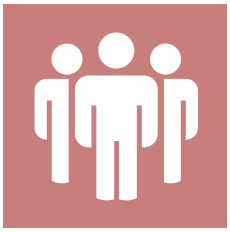


Scheduling

- Class Period
- School Day
- School Year
- Summer Programming

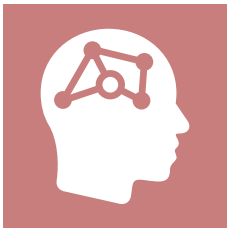
Targeted Support

- Advisory
- Ability
- Grouping



Staffing

- Class Size
- School Size
- Looping
- Teacher Roles



Professional Learning

- Common Planning Time
- Professional Learning Time

Scheduling

- Class Period
- School Day
- School Year and Summer Programming

Class Periods

The decision over how long to make class periods often comes down to use of block scheduling elements, which may then lead to choices around semesters or trimesters of courses for students. Block scheduling often involves establishing class periods of 90 or more minutes; a common block schedule is the 4x4 plan in which students complete 8 courses in a year - 4 in the fall, and 4 in the winter/spring - but A/B schedules, trimester plans and others are also utilized (see Appendix A for examples).[43]

Schools move to longer class periods to minimize transition time, provide more in-depth learning for students, create longer periods of professional development for teachers, and foster deeper student-teacher relationships (e.g. move from 5-6 periods with over 100 students to 3-4 periods with 70-80 students).[44] However, block scheduling may decrease total instructional time - for example, 90 days with 90 minute periods results in 135 hours of instruction compared to the 165 hours one would have in 55 minute periods over 180 days.

Research on block scheduling has shown mixed results, indicating (as with other time-based initiatives) that expanding time in school will provide value only if it is accompanied by high quality instruction.

School Day

Most American schools operate on a 6.5 hour school day, though a recent report highlighted over 1,000 public schools (603 charter, 399 district) that operate between 7-8 hours per day.[45]

Additional time from extended school days may be used time to go deeper in core academic subjects, provide additional opportunities for planning and professional development, and provide extra enrichment opportunities for students. A number of studies have attributed extended school days as a factor in academic success, and the National Education Association has identified several success factors and implementation options for extended learning opportunities.[46,47] Under the Obama administration, School Improvement Grants (SIG) substantially funded extended school day efforts.

Extending the school day may have major consequences for working parents and students. The Center for American Progress has advocated for 9-to-5pm school days to better align parent and school schedules after finding, for instance, that more than 1 million fewer mothers of elementary age children work full-time (compared to mothers of secondary counterparts), resulting in $35,000 in median wages lost annually.[48] On the other hand, leaders may need to address parent concerns that longer school days interfere with the need for students to work or take care of siblings.[49]

As with most time-based initiatives, more time does not always equate to improved academic outcomes. Since it is difficult to find control groups (the day is expanded for

all students, not a portion), it can be difficult to isolate the impact of extended school day efforts.[50]

School Year and Summer Programming

The consideration of a year-round school calendar often stems from the desire to address "summer learning loss" - the issue that students may lose up to a month or more of academic learning over the summer, potentially leading to increased achievement gaps or repetitive curricular experiences.[51] In fact, one study from Baltimore found that a majority of the achievement gap between high and low-income 9th graders could be traced to differential summer learning opportunities stemming from elementary school.[52]

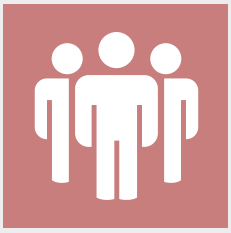
Some districts respond by extending the school year or switching to year-round school calendars. Year-round calendars come in single or multi-track options. Under a multi-track format, often used to address overcrowding, 3-4 cohorts of teachers and students are grouped together, and at any given time 1 track is on vacation. Single track systems typically are designed to shorten the length of vacation time. Examples of year-round calendars include:[53]

- 45-15 calendar: 45 days (9 weeks) of instruction, followed by 15 days (3 weeks) of vacation/intersession (example)
- 60-20 calendar: 60 days (12 weeks) of instruction, followed by 20 days (4 weeks) of vacation/intercession
- 45-10 calendar: 45 days (9 weeks) of instruction, followed by 10 days (2 weeks) of vacation/intersession.

Academic research on the impact of year-round schools is generally considered inconclusive, with some studies demonstrating positive effects, but many lacking the rigor to establish causality between calendars and outcomes.[54]

Because extending the school year is costly, many districts turn to summer programming options - whether mandatory or voluntary offerings at school, community-based partnerships, or simply read-at-home efforts. There is compelling evidence that students attending summer programming have better academic outcomes than peers who do not, with programs of high quality emphasizing individualized instruction, parental involvement, and small class sizes.[55] Yet many districts underinvest in summer programming partly due to cost, which can range from $1000-3000 per child for a 5-day per week, 6-week program.[56]

When investing in summer programming or longer school years, unintended consequences should be considered - for example, some research suggests that while all students can benefit from additional time for learning, achievement gaps may widen as students at the top end of the performance curve improve more rapidly than their peers.[57] Additionally, some argue that summer offers an opportunity for students to engage in play and take a break from overly academic school schedules. Others counter that education is the only public service that shuts down for months at a time, and given the especially acute and unequal impact on low-income families, summer learning loss is a critical problem worth solving.



Staffing

- Class Size
- School Size
- Looping
- Teacher Roles

Class Size

The discussion of class size can lead to heated debates and strong opinions. Proponents of lower class size emphasize the ability of teachers to build better relationships with students, better understand their strengths and needs, and have more time to address them due to fewer demands on grading and recordkeeping. On the other hand, many stress that the quality of teachers should be prioritized over the number available.

Some have placed the magic number of students at 15, citing research suggesting that class size reductions from 40 to 20 have little impact, with reductions from 20 to 15 showing positive academic gains.[58] In general, it appears that class size reductions are most effective in lower grades.[59]

The international context provides interesting perspective, where high-achieving countries like Finland, Japan, and Korea vary widely on class size (from 20 in Finland to over 30 in Korea/Japan). In fact, in many Japanese subjects teachers prefer larger class sizes because of the belief that the range of problem-solving strategies students pursue will be wider, leading to better class discussion (a 6-week of summer vacation helps allow for more time spent exploring material during a longer school year).[60] Whatever the decision on class size, OECD concludes that systems that prioritize teacher quality over class size policy tend to have strong results.[61]

School Size

The small schools movement, often pegged as an effort to create high schools of 400 students or less, had much of its roots in educator Deborah Meier's success leading Central Park East schools in the 1980s and 90s. In the early 2000s major philanthropies such as the Gates Foundation poured in billions of dollars to help school districts create new smaller schools, or break up existing large schools into smaller, more autonomous units - most prominently in New York City. According to the Gates Foundation, school size was not the ends in itself but a means to a successful learning environment: "A small school size was deemed a necessary but not sufficient condition for creating the desired learning environment: close, personalized relationships between students and faculty and the individualized instructional program and tailored assistance needed to motivate and enable students' high performance."[62]

However, a report showing lackluster academic gains in New York schools eventually led the Gates Foundation to pull back on its funding efforts - curriculum and instruction in schools of all types were found to lack rigor and questions of financial sustainability lingered.[63] Others pointed out that small schools lacked resources to provide appropriate courses, activities and electives that larger schools can afford.[64] In part due to the large influx and withdrawal of philanthropic dollars, the small schools movement is often deemed a failure.[65]

However, more recent research has shown positive impacts of efforts to reduce the size of schooling. Reports have shown increased high school and college graduation rates for students in small schools, particularly black males, in New York City as well as elevated graduation rates in Chicago.[66,67] Creating small schools, as with other structural fixes like class size or scheduling, is a sound redesign strategy only to the extent that it drives improvement in instructional quality. As one professor noted:[68]

> *The theory of action—that wholesale reproduction of a particular structure would lead to equal learning outcomes—simply didn't make sense. To paraphrase the policy scholar Richard Elmore, schools are vessels "into which educators and communities" can "pour whatever content and pedagogy" they want. In other words, the size of a school building is a limited tool that leaves most of the instructional core untouched.*

Looping

(also known as "Multi-year grouping", "Persisting groups", etc.)

"Looping" pairs teachers with the same group of students for 2 or more consecutive school years. It is a common practice in Waldorf schools, in which students remain with the same teacher from grades 1-8, and in German schools, where students remain with the same teacher from grades 1-4.[69]

Looping teachers is meant to foster deeper relationships with students and better understand their strengths and weaknesses; additionally, it may allow for teachers develop expertise in a subject across grade levels. However, a teacher advancing to another grade may lose the experience of perfecting lessons at a specific grade level. There is also a risk that some cohorts of students may be paired with ineffective teachers for multiple years at a time.

While quantitative research on looping is sparse, there is some qualitative evidence supporting the practice.[70] Consider how your stakeholders might react to looping by reading this teacher OpEd or this overview of looping for superintendents.[71,72]

New Teacher Roles

New teacher roles might be considered in school design in order to (1) Attract or energize teachers through a focus on new skills and models of instruction (2) Extend the impact of great teachers and boost their retention through new leadership roles and compensation methods. Research findings that encourage consideration of new teacher roles include:[73]

- There is a positive relationship between employees' ability to advance in a career and motivation to improve
- Teachers who teach multiple subjects, such as ELA and math, would likely be more effective concentrating on a subject of strength
- Low-performing teachers can perform as well as their average counterparts when collaboration and social capital among teachers is strong

Examples of how new teacher roles are structured include:

- The Enlarged City School District of Middletown restructured elementary school teacher roles to allow for focus on either math or ELA instruction, developing targeted supports to help teachers make the shift.[74] This effort aligned with Middletown's work to further personalize learning with students as a partner of Education Elements.
- The Generation Schools network has designed teacher roles to take advantage of different skillsets on staff. It hires teachers to lead either Foundation or Studio Courses. Foundation teachers lead instruction through core academic content; a Studio teacher's' primary role is to provide differentiated supports for students,which may include short-cycle courses in literacy and math, with the additional responsibility to teach electives. All teachers have up to two hours of common planning time each day (see more in Appendix B)
- Public Impact's Opportunity Culture initiative looks to extending the impact of great teachers through a variety of roles, such as "multi-classroom leaders", who support their peers while retaining responsibility for students.[75]

Targeted Support

- Advisory
- Ability
- Grouping

Advisory Period

Advisory periods create regularly scheduled time for students and staff to meet and discuss academic and social support. They are often designed to increase the feel of personalization and connectedness at a school site. Partly due to the diversity of implementation strategies for advisory periods, however, there are few rigorous quantitative studies highlighting their benefits.[76] And while the intentions of advisory may be promising, the structure itself may not be the most effective method of getting to know and understand students - one study found a positive association between personalization efforts and academic outcomes but a negative one between advisory periods and achievement, suggesting that students might reject the formal structure of advisory periods and favor the more informal, authentic interactions with adults in regular class periods [77].

Nevertheless, where advisory periods have been successful, Brown University highlights five key characteristics:[78]

- **A clearly defined, stated purpose** - the purpose of an advisory program determines its organization, content, assessment, and leadership (sample goals include advising students about academic decisions, developing peer relationships and conflict resolution

practices, having upper class students advise lower ones, etc.)

- **Thoughtful organization** - time, space, and class size in advisory should meet its purpose (e.g. if review of personalized learning plans are a goal, teachers ought have sufficient time to meet with students during each advisory period). One review of successful advisories suggests heterogeneous groups, student load of 20 or fewer, and daily meetings. Support and planning time for advisory leaders is critical.
- **Relevant content** - schools determine whether to have a common advisory curriculum or allow each instructor to set goals and activities. Most often, content is centered on personal, academic, and career-related themes, with students most engaged when content is relevant to their lives and some level of choice is available.
- **Ongoing assessment** - determining the impact of advisory programs may involve evaluating a range of data, and teams should have time dedicated to reviewing data and discussing progress.
- **Strong leadership** - the strongest advisory programs have a committee or individual overtly in charge of organizing activities

Ability Grouping

(within-class grouping)

Ability grouping generally refers to sorting students in a single class into different groups for instruction; in practice, teachers might form ability groups with a homogenous and heterogenous composition of students.

A variety of studies and differences in research methodology have led to mixed results on the impact of ability grouping. On the negative side, many argue that bias may inform groupings and result in low expectations for students, particularly along race and class lines.[79] Some studies have found negative impacts associated with ability grouping in the form of low outcomes and low levels of self-esteem for low-ability students.[80,81] Others have found little to no impact resulting from grouping practices at the secondary level.[82]

However, several evaluations have found positive associations with ability grouping and academic outcomes, leading to conclusions that flexible ability grouping works.[83]

- A 2016 second-order meta-analysis spanning 100-years of research found positive outcomes associated with ability grouping and acceleration practices for students, particularly for grouping students across grade levels for reading instruction[84]
- A 2010 meta-analysis found positive impacts on reading achievement[85]
- A 1996 meta-analysis found positive impacts for homogenous groupings and recommended specific techniques for small group instruction[86]
- Ability grouping was found to have beneficial effects for both high and low-performing students in Dallas Independent School District in a 2013 study[87]
- A 1990 best-evidence synthesis showed cross-grade ability grouping for reading instruction and within-class ability

grouping in math have showed positive effects, with no evidence supporting the assignment of students to self-contained classes according to ability.[88]

Perhaps because of its association with tracking, support for ability grouping can be mixed, even as teachers report using it in practice for differentiation.[89] However, the evidence seems to suggest that within-class grouping free of bias and based on data can lead to positive outcomes for students at all academic ability levels. Thoughtful implementation of targeted instruction in small, flexible groups is therefore a key component of Education Elements' Core Four components of personalized learning.

Professional Learning

- Common Planning Time
- Professional Learning

Collaboration Time for Teachers

Teachers often seek out one another when facing classroom challenges - they have been found to be twice as likely to reach out to one another than district experts, and four times as likely to ask for help from a colleague than a principal.[90] Coupled with evidence that both high and low ability teachers with strong ties to one another perform better, many organizations seek to create more time for teachers to meet with one another.

The baseline level of collaboration time in America is low compared to other countries: the typical American teacher is allocated between 3 and 5 hours per week for lesson planning, whereas teachers many European and Asian spend between 15 and 25 hours per week meeting with colleagues, planning lessons, observing one another, or meeting with parents and students. American teachers spend 80% of their time delivering lessons compared with an average of 60% of teachers in other countries; in South Korea, only 35% of a teacher's time is spent delivering lessons (similar to Japan and Singapore), and teachers work in shared office space during out of class time.[91] In some cases planning time is available because of a longer school year, and in others because of a shorter school day with students - either investment can result in additional collaboration time for staff.

The amount of recommended time for teacher collaboration may vary, but one study calls for at least 10 hours per week of time for teachers to plan collaboratively, analyze student work, and join together in job-embedded professional learning.[92]

Professional Learning

Professional learning impacts student achievement, but the amount of quality professional learning American teachers experience is low. Research suggests training experiences of less than 14 hours show no impact on student achievement, while "well-designed, content-specific" learning for teachers averaging 49 hours over 6 to 9 months may produce significant gains of up to 21 percentile points on student tests.[93]

To build in time for professional learning, many schools reorganize scheduling to create collaborative planning and formal blocks of learning. But as with all time-based initiatives, the quality of work within new time periods dictates outcomes. Many organizations adopt standards for professional learning, and recent research suggests 7 characteristics of effective professional learning:[94]

1. Is content focused
2. Incorporates active learning utilizing adult learning theory
3. Supports collaboration, typically in job-embedded contexts
4. Uses models and modeling of effective practice
5. Provides coaching and expert support
6. Offers opportunities for feedback and reflection
7. Is of sustained duration

How might we think about changing school designs? Next Steps

When studying structural choices like the length of a school day or collaboration time for teachers, it can be difficult to pinpoint the impact on something as complex as student learning. Research often provides conflicting findings and viewpoints within a given topic, leaving practitioners the task of figuring out "what works." Still, it's worth considering general benchmarks and practices from other organizations or even countries in order to test assumptions and refine new ideas.

1. **Ensure your vision for instructional quality is clear.** Changes to school days, class sizes, grouping strategies, teacher collaboration time, or other systemic shifts should all be made through the lens of an organization's view on high-quality instruction; otherwise, you risk doing more of the same, but longer, or for fewer students at a time, etc.
2. **Develop a theory of action for the critical problem(s) you are trying to solve.** A theory of action often takes the form of an "If..then..." statement. "If we create new teacher roles focused on student support, then..." or "If we create 2 extra hours of teacher collaboration time per week, then ... " Having a sound theory of action for a design shift should force stakeholders to consider the problem they're focusing on, the direct impact of changes made, any unintended consequences that may arise, and how you'll know if your design shift has led to desired results.
3. **Commit to monitoring the progress of your investments in multiple domains.** While there may be an evidence base that supports your model design choices, it's critical to determine the impact that is being made in your context for your organization. Academic outcomes are typically the data point that stakeholders want to review, but establishing causality can be very difficult: consider how you might include survey data, focus groups, or visits to school buildings in order to check in with the attitudes, emotions, changes in practice, and individual thoughts of those impacted by structural shifts.

4 Conclusion

The 180-day, 6.5 hour/day school calendar with 6 subjects did not begin with the question "What do students need from schools in order to be successful in the 21st century?" It's the result of years of policy decisions in education that have layered upon one another to create what we view as "normal" in education. Additionally, regardless of the results of your current district, thoughtful leaders owe it to their constituents to reflect deeply on how the world is changing around schools, and whether what and how students are learning will prepare them for what comes next.

With these realities in mind, efforts to redesign schools often follow with changes to time, staffing, or course offerings, which can all be fundamental levers to pull in order to optimize student learning. However, any school redesign effort should rest on a sound instructional vision and practices, or it carries the risk of doing more of the same (but longer, or with more people, etc).

Going forward, Part 2 of this series will focus on principles that leaders should consider in school redesign efforts, as well as highlight some of the most promising school design efforts at schools across the country. We hope both this guide and the one that follows assists you in your efforts to rethink what schooling can mean for students, families, and staff members in your community.

A Appendix

4X4 BLOCK SCHEDULE (PAGE 3, FIGURE 1)

FALL	SPRING
Course 1	Course 5
Course 2	Course 6
Course 3	Course 7
Course 4	Course 8

A/B BLOCK SCHEDULE (PAGE 4, FIGURE 2)

MONDAY A-Day	TUESDAY B-Day	WEDNESDAY A-Day	THURSDAY B-Day	FRIDAY A-Day	MONDAY B-Day
Course 1	Course 2	Course 1	Course 2	Course 1	Course 2
Course 3	Course 4	Course 3	Course 4	Course 3	Course 4
Course 5	Course 6	Course 5	Course 6	Course 5	Course 6
Course 7	Course 8	Course 7	Course 8	Course 7	Course 8

TRIMESTER SCHEDULE (PAGE 5, FIGURE 3)

TIME	TRIMESTER 1 (60 Days)	TRIMESTER 2 (60 Days)	TRIMESTER 3 (60 Days)
Morning	Course 1	Course 3	Course 5
Afternoon	Course 2	Course 4	Course 6

75-75-30 PLAN (PAGE 6, FIGURE 4)

FALL TERM (75 Days)	WINTER TERM (75 Days)	SPRING TERM (30 Days)
Course 1	Course 4	Enrichment, extra work, or a new course.
Course 2	Course 5	
Course 3	Course 6	

COPERNICAN PLAN (PAGE 7, FIGURE 5)

TIME	TRIMESTER 1 (60 Days)	TRIMESTER 2 (60 Days)	TRIMESTER 3 (60 Days)
Morning	Course 1	Course 3	Course 5
	Course 2	Course 4	Course 6
Lunch			
Afternoon	Seminars of interest		
	Electives /	Music /	Phys. Ed. / AP

B Appendix

TEACHER ROLES, GENERATION SCHOOLS (PAGE 8)

	FOUNDATION Teachers	STUDIO Teachers	INTENSIVES Teachers
PRIMARY Role	Teach 2 core Foundation courses each morning	Teach 2 core Foundation courses each morning. Teach 3 Studios each afternoon (electives, other courses, mandated services, etc.)	Teach Intensive courses focused on college and career readiness. Each lasts for one month.
SECONDARY Role	Teach one Studio course each afternoon, or provide mandated services.	Provide administrative support (attendance, scheduling, IEP compliance, etc.)	Provide Smart Start support to launch the school year and college and career guidance throughout the year.

DAILY SCHEDULE, GENERATION SCHOOLS (PAGE 10)

STUDENTS	FOUNDATION TEACHERS	STUDIO TEACHERS
FOUNDATION CHOICE 18-22 students | 90 min.	FOUNDATION CHOICE 18-22 students | 90 min.	COMMON PLANNING TIME FOR EVERY Studio TEACHING TEAM 120 min.*
FOUNDATION CHOICE 18-22 students | 90 min.	FOUNDATION CHOICE 18-22 students | 90 min.	60 min. Administrative Duty
LUNCH + Advocacy GROUPS 75 min.	LUNCH + Advocacy GROUPS 75 min.	LUNCH + Advocacy GROUPS 75 min.
STUDIO COURSE 30 students | 75 min.	STUDIO COURSE 30 students | 75 min.	STUDIO COURSE 30 students | 75 min.
STUDIO COURSE 30 students | 75 min.	COMMON PLANNING TIME FOR EVERY FOUNDATION TEACHING TEAM 150 min.*	STUDIO COURSE 30 students | 75 min.
STUDIO COURSE 30 students | 75 min.		STUDIO COURSE 30 students | 75 min.
EXTRACURRICULAR ACTIVITIES (optional for students & staff)		

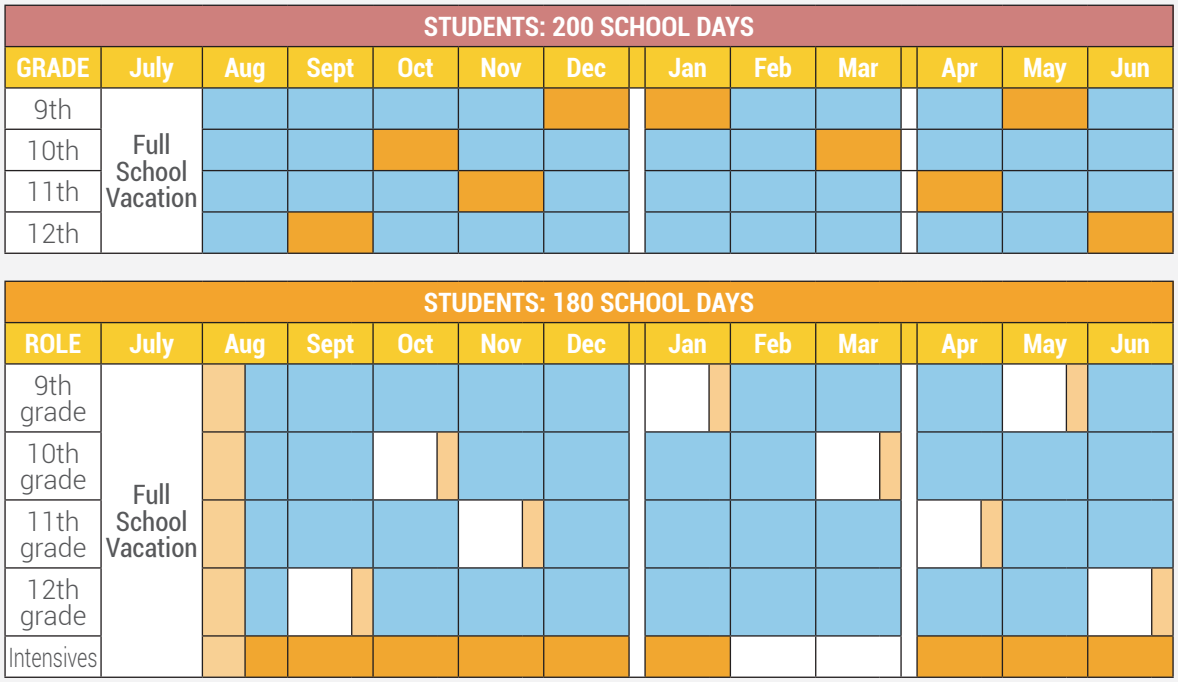
WEEKLY COMMON PLANNING TIME TOPICS, GENERATION SCHOOLS (PAGE 11)

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Integrated Unit Planning	College/Career Support & Planning	Data Review & Rti/SPED Support Planning	Reviewing Student Work to Choose High Quality Exemplars	Advocacy/ Advisory Planning

ANNUAL SCHEDULE, GENERATION SCHOOLS (PAGE 12)

- Vacation
- Professional Development - all teachers get at least 20 days of job embedded PD a year
- Foundation & Studio Courses / Teacher Instruction
- College & Career Intensives / Teacher Instruction

ANNUAL SCHEDULE



Note: 1) Teachers have a one-month vacation in July. They also have two separate 4-week breaks throughout the school year consisting of three weeks of vacation and one week of team planning.

2) A side agreement with the United Federation of Teeachers in New York and an Innovation Plan in Colorado allows for this schedule.

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