THE EDUCATOR'S DILEMMA:

When and how schools should embrace poverty relief

BY MICHAEL B. HORN AND JULIA FREELAND

CLAYTON CHRISTENSEN INSTITUTE
for DISRUPTIVE INNOVATION

EXECUTIVE SUMMARY

For decades, school reformers and poverty relief advocates have argued about what it takes to close the achievement gap. Some scholars, like Abigail and Stephen Thernstrom, argue that school-based interventions are the most promising solution. Others, like Richard Rothstein, argue that schools are not the most efficient platform for fighting the effects of poverty and that society could better help low-income students succeed in school by spending scarce dollars on programs that target children's health and well-being. With the aid of sound theory, the *theory of interdependence and modularity*, we can see that both sides are right—and that both are also wrong.

Insights from the theory of interdependence and modularity

The theory of interdependence and modularity shows that:

- When an organization must improve to serve more demanding and challenging users who are underserved by existing options;
- and the way the parts within the given system interact are not yet well understood and are therefore unpredictably interdependent;
- the organization must integrate to control *every* critical component of the system in order to make *any* part of the system function.
- When there are no unpredictable interdependencies in the design of the service's parts, organizations can use a modular architecture;
- modular parts fit and work together in well-understood, crisply codified ways and can be developed in independent work groups or by different organizations working at arm's length.

In other words, when driving toward greater performance with moving parts that are unpredictably interdependent, in order to do *anything*, the organization must do nearly *everything*.

For schools, this means that to help low-income students who are underserved by existing schooling options succeed academically, they must integrate backward in an interdependent way into the nonacademic realms of low-income children's lives. This approach heeds the wisdom of both the Thernstroms and Rothstein but in contexts that neither imagined.

Education institutions that are integrating backward

The conundrum the U.S. education system faces is that society is asking it to deliver breakthrough academic results for the highest need students, but in a world in which we don't understand the precise solutions that can drive these outcomes. We have constrained our ability to succeed by structuring the school system in a modular, rather than an interdependent, manner.

There is hope though. Over the past decade, several educational institutions serving low-income students have begun to attack the effects of poverty by integrating beyond schools' traditional academic domain to embrace the sorts of supports—mental health services, pediatric care, and mentoring, to name a few—for which poverty relief advocates have long called.

The paper profiles four of these efforts in:

- KIPP
- Community schools
- Harlem Children's Zone
- The SEED schools

Studying these institutions' different approaches to integrating backward, whether and how they do so to drive academic outcomes, and the level of interdependence in their architecture helps explain their different levels of success in driving student outcomes. Analyzing their efforts offers two key lessons:

- Merely integrating backward to offer wraparound services with outside providers in a modular fashion is not enough to help low-income students succeed academically; the architecture must be interdependent so that the school can control the balance, mix, and type of services offered to each student.
- The success of these models appears to turn on the end goal around which they are integrating; if addressing the achievement gap is not the driving force that causes a school to integrate backward, such that all the services offered are deployed to achieve this goal, then we are unlikely to see dramatic changes in academic results for low-income students.

Looking ahead: A flip to a modular world

Today, schools must integrate backward in an interdependent way in order to drive breakthrough results for the most demanding students. A key criticism is that it is costly for school systems to integrate into nonacademic realms. The theory of interdependence and modularity, however, shows that the costs of not integrating are in fact higher to society; they are just hidden from the financial statements of any one organization. The theory also predicts that, over time, as integrated schools start to succeed in serving low-income students and we gain a clear sense of the causal mechanisms that lead to this success, the education system will modularize, which will in turn create greater efficiencies.

In education, however, we are attempting to short circuit this process by operating in a modular manner, despite the fact that we have not achieved breakthrough results for the highest need populations at scale.

INTRODUCTION

A major battle waged in education reform is over whether it is possible to educate successfully low-income students without first solving poverty and the effects it has on students' potential to thrive. On one side, champions of school-based reforms, like political scientist and historian Abigail and Stephen Thernstrom, hold up examples of certain charter schools—"no excuses" schools—that have posted dramatic successes educating minority students from low-income backgrounds.[1] On the other side, their opponents protest school-based approaches. Education researcher Richard Rothstein indicts the "peculiarly American belief that schools can be virtually the only instrument of social reform … not based on evidence about the relative effectiveness of economic, social, and educational improvement efforts."[2] He instead calls for broader based poverty relief interventions.

The debate is complex. Rothstein points to how difficult it is to sustain and scale such "no excuses" schools given teacher burnout. He also argues that the students whom these schools serve are "creamed" from the top-performers in the low-income populations.[3] Instead of expanding these efforts, Rothstein contends that limited resources dedicated to closing the gap in academic performance between ethnic and socioeconomic groups would be better spent on non-school initiatives—like vision and health care, stable housing, or higher wages—that either boost family income itself or reduce the predictive effects of poverty on student success.

Champions of school-based reform, like the Thernstroms, retort that poverty relief efforts have historically shown little effect on academic achievement and that "culture" matters more than family income. They argue that schools that focus on building a culture of success appear to overcome the predictive power of race and poverty on student outcomes.

Rothstein, on the other hand, estimates a lesser role for culture. "Childrearing practices, role modeling and values play a role, but even more important may be differences in the actual social and economic conditions of the classes," Rothstein wrote.[4] He suggests rather that there are a litany of areas—vision, hearing, oral health, lead exposure, asthma, medical care, alcohol, smoking, birth weight, nutrition—in which, on average, poor children, regardless of race or culture, fare far worse, which in turn limits their academic prospects.

We have a different perspective. With the aid of sound theory—*the theory of interdependence and modularity*—we can look past the debates in which each camp brandishes its data set to combat the other's argument. Instead, we can see that both sides are right—and that both are also wrong.

Disadvantaged students on the wrong side of the achievement gap *do* need more than stronger academic programs and a focus on culture in their schools to succeed. As Rothstein argues, nonacademic services—supporting health, nutrition, "soft skills," and more—are necessary

The theory of interdependence and modularity can cut through the age-old poverty relief versus school reform debate.

ingredients for serving many low-income students successfully. But in some cases, those wraparound services are actually being administered within school buildings themselves. As it turns out, a number of schools and institutions—some of the very schools that champions of school reform tout—are providing many of the supports for which champions of poverty relief call. Schools that effectively integrate high levels of nonacademic services into their models in an interdependent way may be unlocking a potent antidote to the achievement gap. These approaches can in turn start to render the age-old schools versus poverty relief debate moot.

The mix of services and the manner in which they are delivered matter though. Beyond simply providing *access* to more nonacademic services, for the foreseeable future schools must *control* the provision of services so that they can adjust the level, types, and mixes of supports to drive academic outcomes.

This is unsurprising if we look to how other sectors have evolved. If a company wants to improve a product or service to serve more demanding users who are presently underserved by the existing options, it likely needs to integrate backward across a value chain to control every critical component of the system in order to make any part of the system function. By building an *interdependent architecture,* companies effectively control the parts of a value chain that are not yet well understood and established. With this degree of control, they can organize their teams such that they can tweak and tailor the right mix of services in a nonstandard way to deliver a workable solution. Schools attempting to close the achievement gap may need to do just that: tightly integrate and control a range of supports—like health care, character development, and other nonacademic services—into their model in nonstandard ways in order to improve student learning outcomes.

In recent years, a host of reformers, policymakers, and journalists have shed light on K–12 school systems that have begun to offer students a range of services beyond just academics in a variety of ways—not necessarily in an interdependent architecture. In 2008, Paul Tough's book, *Whatever It Takes: Geoffrey Canada's Quest to Change Harlem and America,* put Harlem Children's Zone and its leader Geoffrey Canada in the public spotlight. The book catalogs the breadth of research on numerous non-school factors that correlate with poor children's outcomes and chronicles Canada's efforts to integrate cradle-to-career services for children and parents in Harlem. Since then, President Obama has called for more wraparound models like Canada's throughout the country and funded so-called "Promise Neighborhoods" in 50 communities nationwide.[5]

Also in 2008, veteran journalist David Whitman published *Sweating the Small Stuff: Inner-City Schools and the New Paternalism,* which highlights the particular successes of six "no excuses" schools—among them, KIPP, the nation's largest network of high-performing public charter schools, and the SEED schools, a network of public charter boarding schools located in Washington, D.C., Maryland, and Miami—that serve primarily low-income and minority students. The book applauds this breed of schools' successful combination of efforts to close the achievement gap by extending the academic school day, teaching "character" and soft skills, and setting a culture of high expectations among students and families. The Obama administration has also lauded the "no excuses" approach through policies like the Investing in Innovation Fund (i3) that supports the expansion of numerous high-performing charter schools.[6]

Finally, although so-called community schools have existed for a number of decades, the community-schools model has garnered increasing attention in recent years. Through a broad range of partnerships, a community school establishes a neighborhood's public school building as the hub where children and families can access health care and other social services and coordinates these services based on local needs. In the last

Some school systems have begun to offer students a range of services beyond just academics.

decade, Cincinnati Public Schools adopted a district-wide community-schools model that has drawn national attention from superintendents in large cities and U.S. Secretary of Education Arne Duncan.[7] Community schools, likewise, have champions in Congress, such as Representative Aaron Schock (R-Ill.) and House Minority Whip Steny Hoyer (D-Md.), who introduced the Full-Service Community Schools Act of 2014 in an attempt to bolster funding for these efforts nationwide.[8]

These programs all attempt to tackle the destructive effects of poverty on a child's ability to learn in school. They do so by offering services not commonly thought of today as the domain of schools.[9] A closer look at these examples through the lens of good theory suggests two key insights for those trying to close stubborn gaps in achievement based on how schools integrate various nonacademic services into their models. First, the degree to which school organizations offer additional services, the degree to which they control the provision of such services and treat the services as interdependent parts, and the degree to which they focus their interdependent design on academic achievement may predict their success in driving academic outcomes. Second, studying how these various interdependent approaches serve particular populations of students may eventually allow for the creation of more efficient, modular solutions—which lend naturally to scaling—for providing academic and social services in the future.

Why integrate backward?

At times, successfully delivering a service requires a highly integrated approach. The theory of interdependence and modularity helps predict when such an approach is necessary.

All products, services, and systems have an architecture, or design, that determines what its parts are and how they must interact with each other. The place where any two parts fit together is called an interface. Interfaces exist within a service, as well as between groups of people or between departments within an organization that must interact with one another.

A service's architecture is *interdependent* if the way one part is designed, made, and delivered depends on the way other parts are designed, made, and delivered—and vice versa. When there is an unpredictable interdependency across an interface between parts—that is, we can't know ahead of time how we must build or use a certain aspect of a service until we have delivered both parts together—then the same organization must develop both of the components if it hopes to develop either component. That is, the organization must operate with a proprietary architecture, which means it must be *integrated.*

Interdependent architectures optimize performance in terms of functionality and reliability. By definition, these architectures are proprietary because each organization will develop its own interdependent design to optimize performance in a different way.[10] This is precisely what successful companies have done when a service is "not good enough" to serve its customers and when the causal mechanisms between constituent parts are understood poorly. Of course, when someone changes one part of a service that has an interdependent architecture, necessity requires complementary changes in other parts. Customizing a service, as a result, becomes complicated and expensive. Many of these interdependencies are unpredictable, so all pieces must be designed interactively. Customizing a service whose architecture is interdependent requires a complete redesign of the entire service.

By contrast, in a *modular* architecture, there are no unpredictable interdependencies in the design of the service's parts. Modular parts fit and work together in well-understood, crisply codified ways. A modular architecture specifies the fit and function of all elements so completely that it does not matter who makes the components or subsystems as long as they meet the defined specifications. Modular components can be developed in independent work groups or by different organizations working at arm's length.

To illustrate, consider the "architecture" of an electric light. A light bulb and a lamp have an interface between the light bulb stem and the light bulb socket. This is a modular interface. Engineers have lots of freedom to improve the design *inside* the light bulb, as long as they build the stem so that it can fit the established light bulb socket specifications. Notice how easily the new LED bulbs fit into old lamps. The same company does not need to design and make the light bulb, the lamp, the wall sockets, and the electricity generation and distribution systems. Because standard interfaces exist, different companies can provide products for each piece of the system.

Modular architectures optimize flexibility, which allows for easy customization. Because people can change pieces without redesigning everything else, real customization for different needs is relatively easy. A modular architecture enables an organization to serve these needs. Modularity also opens the system to enable competition for performance improvement and cost reduction of each module. That said, because modular architectures require tight specification, they allow for fewer degrees of freedom in the design of the system itself. As a result, modularity comes at the sacrifice of raw performance.

Importantly, pure interdependence and modularity are the ends of a spectrum. Most architectures fall somewhere between these extremes. There isn't a "right" place to be. Instead, organizations are more likely to succeed when they match the type of architecture to their particular circumstances.

The architecture of a company or an entire industry will often oscillate between interdependent and modular architectures depending on whether customers demand more performance or greater customizability. At the outset of most new sectors, systems often lack a well-functioning ecosystem with predictable interfaces between adjacent steps in the value chain. At this stage, an interdependent architecture—and thus an integrated offering—makes the most sense. For example, in the early days of the mainframe computer industry, IBM could not have existed as an independent manufacturer of mainframe computers because manufacturing was unpredictably interdependent with the design process for the whole mainframe system: the machines, operating systems, core memory, and logic circuitry. Specifying how these discrete features of the system should fit together was essentially impossible at the outset. If the company had tried to separate each of the components—for example, subcontracting operating systems to one outlet and logic circuits to another—the product would have suffered. The company would have been forced to back away prematurely from the frontier of what was possible in raw performance by specifying these constituent parts too early. And in any given industry, so long as the performance of products and service underperforms customers' needs, companies cannot back off that frontier. It was no coincidence then that, by and large, independent suppliers of those component computer parts did not even exist initially when IBM designed the earliest mainframes.

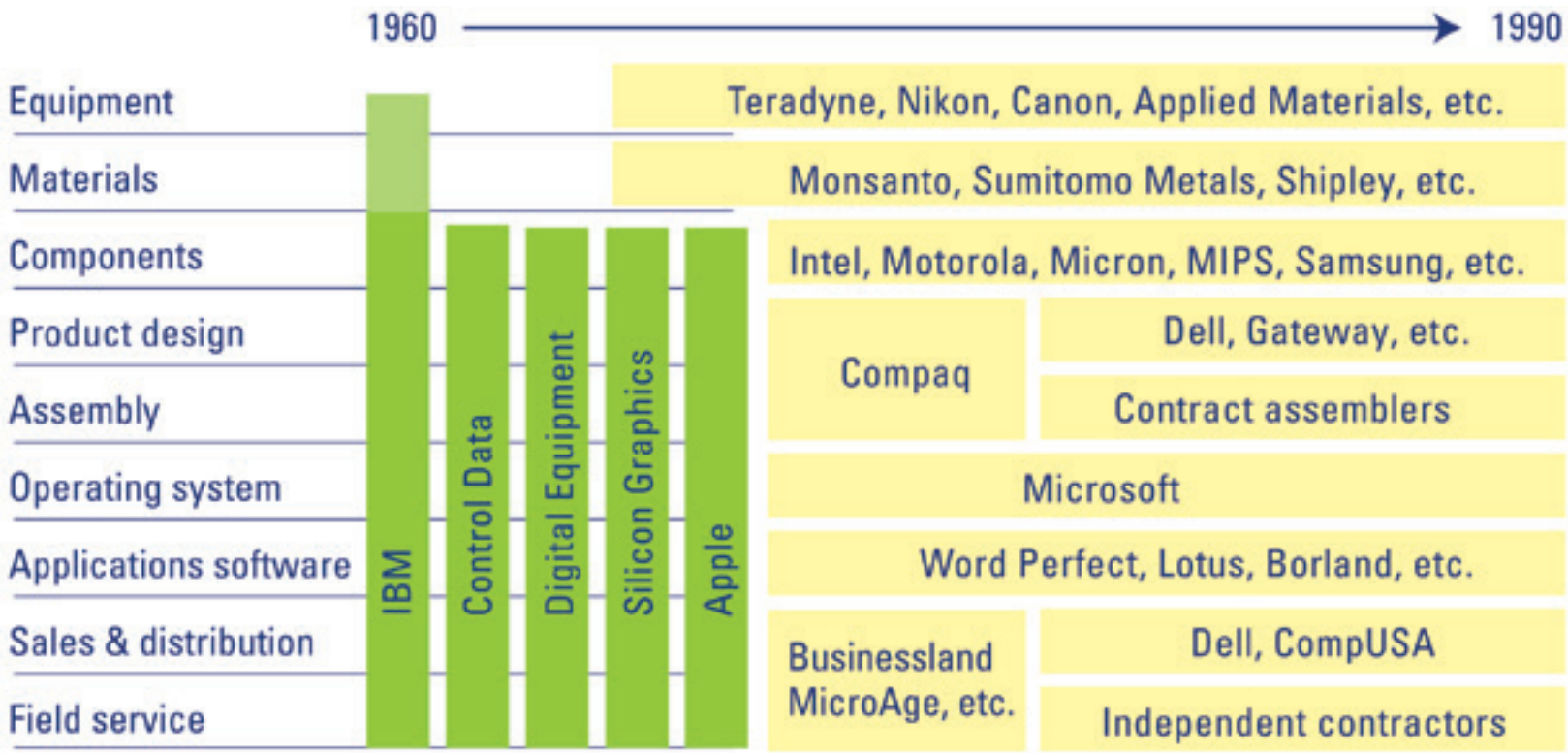
In order to succeed in the manufacture and sale of mainframe computers, IBM had to integrate backward through all of the parts of the value chain of its production that were not yet well understood and established.* IBM had to build the constituent parts of mainframe computers: the company designed the logic circuitry, the application software, the memory systems, and so on. Each one of those systems had to be designed interdependently with the other systems. A change in one part of a memory system might necessitate a tweak in the application software, which could in turn cause a change in how all the pieces fit together. All of this was unpredictable, and fixing or specifying any one interface would have detracted from IBM's iterative design and innovation process. As a result, IBM essentially had to do everything in order to do anything.

Although establishing an interdependent architecture often necessitates creating new parts in-house, organizations can also maintain an interdependent architecture by working exceptionally closely with third-party entities. In the early 1980s, for example, the interface between the microprocessor and the other parts in IBM's early personal computers was somewhat unpredictable. But IBM didn't build the processors in-house; Intel supplied them instead. At the time though, IBM owned roughly 20 percent of Intel, which meant that it could make tweaks to interdependent parts and still rely on Intel to create or adjust parts that supported evolving designs.

The computer industry provides a particularly helpful set of insights into this phenomenon because once a product's performance becomes good enough and the interfaces between its component parts become predictable as designers and engineers develop a sounder understanding of causality, interdependent approaches and designs often give way to modular ones.

* It bears noting that the theory of integration and modularity turns on the concept of causation. Put in different terms, when parts of a value chain are unpredictably interdependent, causal connections between various parts are not well understood. In an education system, for example, if practitioners deploy a range of inputs to support student outputs, but they do not know which of those inputs drove student outcomes, the moving parts of this system remain unpredictably interdependent.

Figure 1. Integration and modularity in the computer industry over 30 years



As described above, in a modular system, the pieces in the system fit together in such well-understood and well-defined ways—there are no unpredictable interdependencies—that it does not matter who makes or provides each component. *Figure 1* illustrates the shift in architecture from interdependent to modular in the computer industry between 1960 and 1990. Dell emerged in the modular age of personal computing to integrate disparate pieces into a coherent whole. Such a modular system trades off the raw performance gains of an interdependent system, like IBM's original mainframes, for the customizability and flexibility of being able to assemble affordably different component parts based on individual customers' tastes and needs. It is worth noting that Dell's customers did not experience the industry's "modular" system as disjointed; the products' parts still worked together seamlessly from an end user's perspective. But the difference here is that Dell was playing the role of "integrator"—bringing together various modular subcomponents that consumers could mix and match—rather than producing interdependent parts in-house as IBM had done.

The theory holds true in other industries. For centuries, companies have been driven to integrate activities that were not at their core in order to reach new heights of performance and distribution. Gustavus Franklin Swift's approach to marketing and selling beef, for example, reflected his willingness to integrate beyond the late 19th-century's model of raising, butchering, and selling beef on an exclusively local basis. At that time, because there was no technology for transporting meat long distances, the beef industry lacked significant economies of scale. Swift saw an opportunity to integrate backward and forward: he centralized butchering in Kansas City, which meant he could process beef at a very low cost. Then Swift designed the world's first ice-cooled railcars. He even made and sold ice cabinets to retail shops throughout the Midwest and Northeast so that once the beef arrived, it would stay fresh. One key to Swift's ability to market beef in far flung regions was the ability to assure customers that the beef was still safe to consume, given that it had traveled all the way from the stockyards of Chicago to the market. Because a clear understanding of refrigeration and meatpacking processes did not exist at the time, Swift had to control the entire process to ensure that the temperature and storage practices remained sound. In other words, Swift had to expand beyond his so-called core competencies and introduce new, interdependent lines of business in order to revolutionize the beef industry.

A service's architecture is *interdependent* if the way one part is designed, made, and delivered depends on the way other parts are designed, made, and delivered—and vice versa.

Should schools be integrating backward to close the achievement gap?

The education system may feel far afield from personal computers or beef distribution channels, but there is at least one important similarity. Many schools, particularly those serving low-income and minority students, may find themselves in a similar "not good enough" position as IBM in the early mainframe days. In an effort to serve students who, on average, perform behind their higher income peers, these schools are serving some of the most "demanding" students in the education system—students whom schools that merely provide academic services and only a few add-on services may not be set up to serve. Schools may need to integrate far beyond their core competency—delivering academics—to produce dramatically better results.

Schools today are pursuing a range of complex jobs that society "hires" them to do—including providing a safe and communal space for learning, preparing students for college and beyond, and nurturing good citizens. Test scores may be, in and of themselves, an inadequate metric for these goals. Yet, however wide-ranging our ambitions as a society are, since the early 1980s, standardized test scores have become the de facto metric for judging how well the nation's schools are serving children.[14] Against these academic ambitions enshrined in federal and state accountability regimes, some schools are still falling short, particularly when it comes to serving low-income and minority students. Although low-income students and their higher income peers have both posted gains, the gap between these groups has barely budged over the past decades.[15]

These persistent gaps suggest that the current paradigm of schooling is stuck in a not-good-enough state when it comes to supporting low-income and minority students. If schools frame narrowly their mission as the delivery of academic content, then they will likely limit their ability to deliver on the larger goal of success for all students, particularly those from disadvantaged backgrounds.

This situation has many parallels outside of education. As an example, many people use IKEA to do a particular "job": "We need to furnish this apartment today!" To deliver, IKEA can't simply offer low-cost furniture. IKEA directly and exclusively engages its own designers to create knockdown lightweight furniture kits that customers can retrieve from the warehouse, take home, and assemble themselves without having to wait for delivery professionals. It designs pieces of furniture that are explicitly meant to be temporary, not heirlooms. IKEA offers childcare for its customers because unfettered concentration on furniture purchases is important; and it positions an affordable cafeteria at the midpoint of the winding journey through the store so that customers can refuel for the second half of the shopping experience.

Schools may be in a similar position. Although society expects schools to educate all students successfully, schools likely can't just offer academics. To reach the performance standards and equity of outcomes set forth in U.S. education policy, the theory of interdependence and modularity suggests that schools educating typically underserved students need to integrate backward to deliver a variety of interdependent supports and services to help those students reach proficiency. Successfully doing so will likely depend on the range of nonacademic services offered and whether the school exerts a sufficient degree of control over the ways in which different academic and nonacademic services interact to find the right balance and mix of services for each student. That way, schools will maintain the ability to tweak continuously these services to match students' needs in a manner that boosts their academic achievement, just as IBM was able to tweak the design of mainframe systems to maximize performance.

This is obviously easier said than done. Incorporating numerous additional services into traditional school models can prove daunting. School systems often lack the expertise and funding to offer a wide array of nonacademic services. Moreover, public policies and funding streams often create silos that separate academic services from other supports, like health care or family support services, which constrain schools' abilities to incorporate these services into their existing systems and processes in an interdependent way.

Schools may need to integrate far beyond their core competency—delivering academics—to produce dramatically better results.

Still, a number of school systems are backward integrating to supply students with numerous nonacademic supports within a new architecture of schooling. Below we describe four systems—KIPP, community schools, Harlem Children's Zone, and the SEED schools—that have erected more interdependent architectures than we typically observe in public education. All four are incorporating supports for students beyond those found traditionally in schools. To varying degrees, they coordinate or control the provision of such services. We are highlighting these schools not to suggest that they are the end-all-be-all of success, but rather to illuminate the structural and programmatic changes that may be necessary to help students be successful in life.

By studying these examples, we have found that although simply offering increased services to support high-need students appears to have some effects on driving test scores, these institutions are still seeing varying—and often disappointing—outcomes in student achievement and college success. The theory of interdependence and modularity suggests that varying degrees of interdependence may be constraining results: schools may, in some cases, lack the ability to create one coherent and aligned offering of services focused on academic success.

This level of interdependence and control matters because schools may need to tweak or restructure both nonacademic and academic services and rethink how these services interact with each other to produce breakthrough results for students. In schools attempting to close the achievement gap, the ability to iterate on the design and dosage of supports is likely a key ingredient to driving breakthrough performance. Even traditional school-level departmental structures may be limiting innovation, as educators may be unwittingly giving away many degrees of freedom in the design of schools that will produce stellar student outcomes out of an adherence to tradition in how academic content delivery has always been delivered.

A key criticism is that it is costly for school systems to integrate into nonacademic realms. The theory of interdependence and modularity, however, shows that the costs of not integrating are in fact higher to society; they are just hidden from the financial statements of any one organization. The theory also predicts that, over time, as integrated schools start to succeed in serving low-income students and we gain a clear sense of the causal mechanisms that lead to this success, the education system will modularize, which will in turn create greater efficiencies. Later in the paper, we discuss how the education system may eventually modularize to deliver efficiently or contract out services that meet each students' individual needs, but that we have yet to witness the levels of performance or the causal insights that form the foundation of such an efficient, modular approach.

In the following case studies, we discuss how the theory of interdependence and modularity sheds new light on why and how a host of new approaches are serving low-income students successfully—as well as a way to understand why they may fall short in certain respects—and how they are not merely "school-based" reforms in the sense of the traditional Thernstrom and Rothstein debate.

KIPP: BACKWARD INTEGRATING INTO STUDENTS' HABITS AND DAY

The Knowledge is Power Program (KIPP) is a national network of public charter schools dedicated to educating students in underserved communities. KIPP schools serve primarily low-income and minority students. Nationally, 88 percent of KIPP students are eligible for free or reduced-price meals and 95 percent are African American or Latino.[16] Although the KIPP network consists of distinct regional charter management organizations (CMOs) that operate as separate nonprofit organizations, these CMOs share a clearly stated end goal across the network: "to prepare KIPP students to succeed in college and lead choice filled lives."[17]

The model

KIPP's approach takes aim at this goal by integrating beyond traditional academic models to include a unique mix of additional supports, particular curricular choices, and targeted interventions in students' and their families' lives. Many families undoubtedly already instill hard work, discipline, and college-going goals into their children; but for the children that KIPP serves, the organization had to incorporate what Whitman dubs "paternalistic" practices into its approach. Unlike a traditional public school, the KIPP model integrates into other parts of its students' lives, including out-of-school hours, home lives, and even "character" or values. As Whitman wrote in *Sweating the Small Stuff*, "In typical KIPP fashion, little is left to chance."[18]

With an extended school day and school year, KIPP controls more of students' time afterschool and during the summer than a typical school.[19] For some students—particularly those from higher income families—more time in school may be unnecessary. But recognizing that its particular students needed additional academic supports, a quiet and safe place to do homework, and fewer vacation days during which learning could slide backward, KIPP added more time into its academic calendar. Most KIPP schools require that students spend 50 to 60 percent more time at school than the average 180 6.5-hour days in a traditional school year. This higher degree of involvement also extends to the home: KIPP parents must sign a contract that enumerates their responsibilities for driving student success. Many students also have access to teachers' cell phone numbers in the evenings to seek homework or other help during non-school hours.

KIPP's approach goes beyond simply more hours of rigorous academics. The organization also takes pains to integrate the development of particular habits and attitudes among its students that it sees as vital to academic and life success. This work has come to be called "character education," which is integrated into the fabric of KIPP's academic curriculum. This involves nurturing new social, emotional, and organizational attitudes in children. In Whitman's words:

> "In typical KIPP fashion, little is left to chance."
>
> —David Whitman, *Sweating the Small Stuff*

> ...they teach students exactly how to live. They unapologetically tell children continually what is good for them. They also compel good behavior and keep adolescents off the wrong track using both carrots and sticks. The students who attend them are closely supervised in an effort to change their behavior and create new habits, and maybe even new attitudes.[20]

For example, KIPP classrooms often use a practice called "SLANT." Students are told to Sit or stand up straight, Listen, Ask and answer questions, Nod your head appropriately, and Track the speaker.[21] Strategies like these, the founders of "no excuses" schools purport, are intended to instill skills that students may not have learned at home.[22] As one KIPP teacher said, "The important thing here is that these elements are all in service of a greater goal: to maximize student learning time in classrooms while cultivating intellectual habits that can be useful in any learning environment."[23] Character education also permeates KIPP's approach to extracurricular opportunities. For example, KIPP Academy in Brooklyn has a long-running orchestra program in which most students participate. As the director of the program said:

> The idea of the orchestra here is not to train musicians—rather it is to use the fact that the orchestra is the one thing that every child at KIPP Academy has in common. ... [O]nce you have one activity at a school that every student is involved in, you can focus on creating culture and discipline in that activity.[24]

Over time, KIPP has also expanded beyond the founders' original vision of designing a robust middle school intervention. In 1998, KIPP co-founder David Levin started the KIPP To College (now called KIPP Through College) program to guide KIPP NYC graduates from their KIPP graduation to their enrollment in college. The program included four components: a summer internship program, after-school tutoring and counseling, education grants and supplemental tuition aid at parochial and independent private schools, and step-by-step assistance in the college admissions process.[25] Since then, the KIPP model has also integrated backward and forward in actual grade levels and in what it tracks. It has moved backward all the way to creating pre-kindergarten schools and forward all the way to 12th grade to create an entire PK–12 school system. KIPP also tracks students through—rather than simply to—college. KIPP expanded to serve more grade levels because it was finding that by middle school—although a pivotal time in students' development—children had already fallen behind academically. Equally troubling, the school found that even with strong academic supports, students were still not prepared in nonacademic realms. As one principal said to Whitman in describing early KIPP graduates leaving 8th grade: "They are academically prepared. But they are not ready yet to deal with the pressures of becoming a teenager. And they cannot always get a lot of help at home."[26] The answer for KIPP has been to integrate backward and forward across the lives of its students even more.

KIPP integrates "character education" into the fabric of its academic curriculum.

Results and analysis

According to federal accountability benchmarks, KIPP posts impressive results and outperforms neighboring schools; in some cases, it even closes entirely persistent racial and socioeconomic achievement gaps.[27]

KIPP's own self-stated goals, however, of seeing students graduate from college exceed those set out in No Child Left Behind. College success, it turns out, is not a given even if you can successfully close the achievement gap in middle and high school test scores. This ongoing attention to its graduates' college data is pushing some in the KIPP network to integrate even more from its students' lives.

For example, KIPP Massachusetts has concluded that its longer school day and year is still not enough to drive college success. It plans to add

even more summer time to its schedule in the coming year in order to offer targeted tutoring for students who need to catch up.[28] KIPP Houston is also integrating further backward to provide a school-based health clinic—called KIPP Care—to its students to decrease the frequency of untreated illnesses that keep students from learning. In an interview, KIPP co-founder Mike Feinberg said, "More and more we're becoming a one-stop shop, which is what a school should be. We have basically turned our traditional nurses' station into a mini health clinic on our campuses." According to KIPP Houston educators, the clinics will aim to "offer a solution for conditions like pink eye, stomach bugs, or rashes that might otherwise be left to fester because parents can't get off work or are unsure where to turn for services."[29]

In other words, in outposts like Massachusetts and Houston, KIPP's backward integration is not yet complete. As leaders focus intently on college success for all graduates, they continue to find that new or additional supports may be necessary to drive those outcomes. This continued iteration in KIPP's architecture shows that as it stands currently, KIPP is not a silver bullet, nor has the network finalized an interdependent design that positions its students for success through college and beyond.

One of the key criticisms levied against KIPP and similar "no excuses" schools is that KIPP systematically counsels out students who cannot thrive in its environment, which in turn "creams" the top students and inflates academic results. The most recent study that Mathematica Policy Research published on KIPP's performance refuted

this claim, as it found similar attrition rates in KIPP and equivalent district schools. Still, critics point out that KIPP does not replace all of the students who leave, particularly in 7th and 8th grade.[30] This criticism perhaps shouldn't come as much of a surprise. Put bluntly, KIPP schools aren't equipped to serve everyone. Although attrition data is often used to attack charter schools, the fact that some students leave KIPP (at their own or the schools' discretion) can be more telling than it is controversial. Seen in a different light, KIPP's challenges help illuminate the fact that different levels and types of integration of services will be required to support students with different needs. The fact that some students do not find a "fit" at KIPP schools suggests that some students may seek a less integrated, interdependent school model with fewer intrusions into their afterschool and home lives; for others, KIPP may still underserve their needs for additional supports and structure that are knit together in a particular fashion, which suggests that we may need even more deeply integrated models to support those children.

"More and more we're becoming a one-stop shop, which is what a school should be."

—Mike Feinberg, co-founder, KIPP

COMMUNITY SCHOOLS: COORDINATING PARTNERSHIPS AT THE SCHOOL SITE

Although the title of "community school" is often applied liberally, the category generally describes school models that centralize a range of services inside the school building by partnering with local service providers to support students—and sometimes adults in the community as well. The concept has been in and out of fashion since early reformers like John Dewey and Jane Addams advocated for holistic, school- and neighborhood-based children's services in the latter half of the 19th and early 20th centuries.[31]

The model

Community schools encompass a wide range of models with varying levels of service, coordination, and community engagement depending on the particular school.[32] At the heart of all of these models, however, is a focus on strategically coordinating partnerships to support student health, well being, and academic achievement. The Coalition for Community Schools, an initiative of the Institute for Educational Leadership that brings together community-schools providers and advocates, analogizes the community-schools approach to a smart phone that hosts various apps:

> Just like smart phones, community schools have an infrastructure or operating system that makes all the 'apps' work in a synchronized manner. A **school-site leadership team**, often comprised of educators, parents, community partners, and others, is responsible for creating a shared vision for the school, identifying desired results and helping align and integrate the work of partners with the school.[33]

In other words, community schools effectively coordinate various service providers to support students, rather than acting as a single provider of all services. In this sense, community schools and their "integrated student supports" appear to have more in common with Dell, which emerged in the modular age of personal computing to integrate disparate pieces into a coherent whole, than with IBM's vertically integrated, interdependent approach to production. If that's the case, then why include them in this discussion around schools and vertical integration? The reason is that, relatively speaking, community schools have backward integrated more than traditional district schools in that they offer and coordinate services

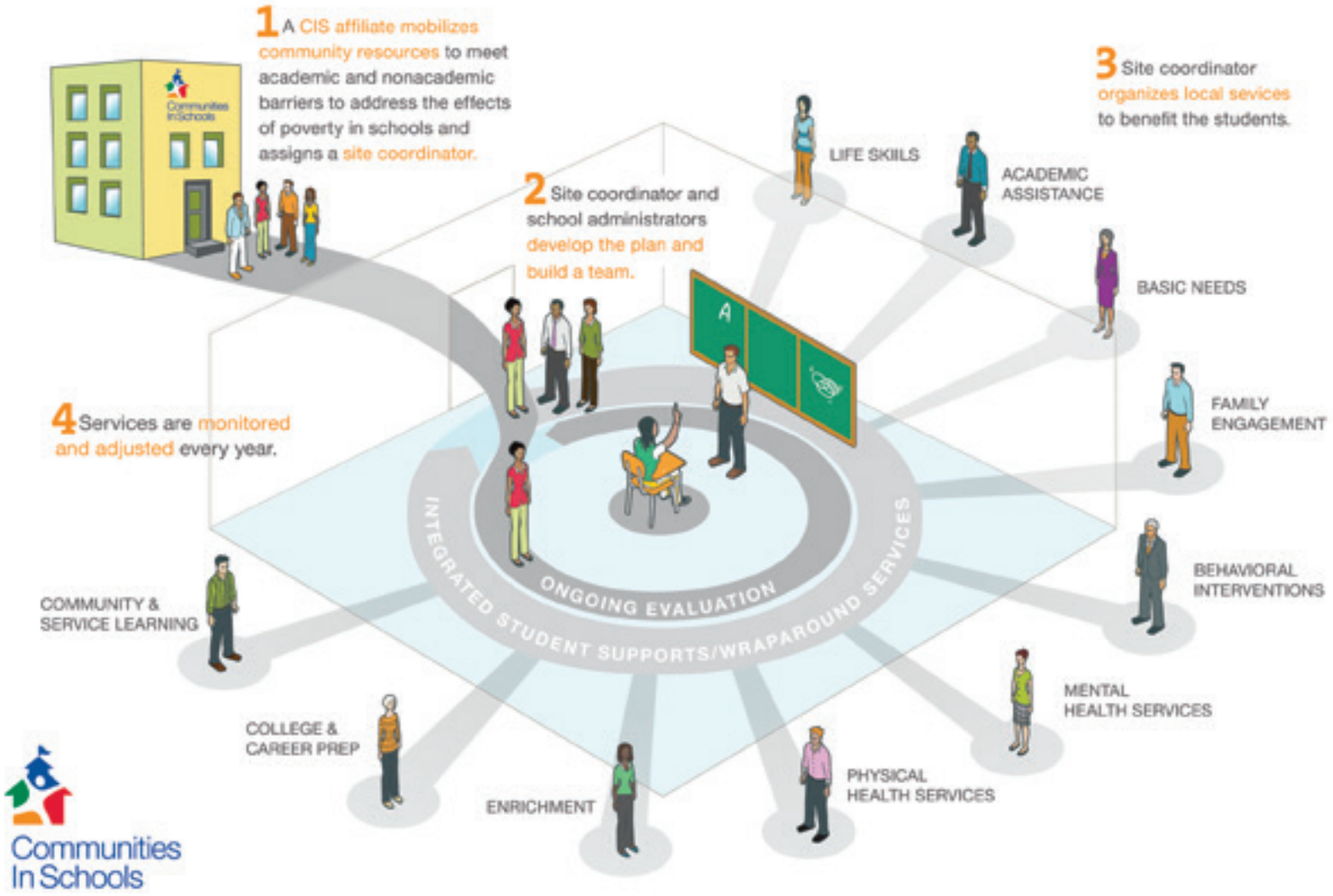
A coordinator works with a range of partners—including local businesses, social service agencies, health care providers, and volunteers—to deliver appropriate services based on students' needs.

not commonly found in traditional schools. The question to explore is whether a given community school has a sufficiently interdependent architecture to serve its student population.There are more community schools than we have room to profile here, so we will point to two high-profile and large-scale efforts.

Cincinnati Public Schools is one of the most prominent examples of a school system taking a district-wide community-schools approach. The district began exploring community-schools models in the late 1990s at the urging of former Governor John Gilligan, who helped initiate and oversee the transformation as a member of the Cincinnati Board of Education.[34] The Board subsequently established a policy that all of the district's schools must become Community Learning Centers (CLCs), and today all 55 schools in the district are in some stage of transitioning to the CLC model. CLC schools strive to promote academic excellence by partnering with a variety of organizations to offer recreational, educational, social, health, civic, and cultural opportunities for students, families, and the community. To manage and align these partnerships, 34 CLCs now have a full-time on-site resource coordinator funded by a blend of public and private support.[35]

The nonprofit Communities In Schools (CIS) offers another popular but very different community-schools model from that in Cincinnati. The organization, which functions nationally as the largest service provider for schools implementing a wraparound-services model,[36] positions site coordinators inside schools to assess students' needs and provide resources to help them succeed in the classroom and beyond. The coordinator then works with a range of partners—including local businesses, social service agencies, health care providers, and volunteers—to deliver appropriate services based on students' needs.[37] *Figure 2* illustrates the CIS model of integrated student supports.

Figure 2. The Communities In Schools approach



Source: Communities In Schools, http://www.communitiesinschools.org/

Results and analysis

The metrics and rates of success of community schools vary widely by organization and locale. Cincinnati has seen consistent but modest improvement in student test scores since it started transitioning to CLC models over a decade ago; as such, its schools do outperform *similar* districts but have not closed the achievement gap—and test scores from many of its school continue to lag behind the statewide averages.[38] There is a dearth of evidence, however, of whether the CLC model or other reforms have caused the schools' slow but steady improvement.

Nationally, CIS has had significant success at solving chronic absenteeism and decreasing dropout rates. Academic gains, as measured by test scores, in its partner schools, however, have been more modest.[39] Comparison studies with non-CIS schools suggest that these outcomes may turn on the quality of implementation and fidelity to the CIS model.[40]

Finally, according to recent research by Child Trends, a nonprofit research center that provides information and insights on the well-being of children and youth, models that incorporate "integrated student supports"[41] are, on average, having some success in improving math scores, but less success in producing significant reading gains[42]—outcomes that to some extent mirror the broader track record of improvement across the nation.[43]

These findings provide some evidence that receiving key nonacademic supports may help students learn more, but there are at least three reasons why community-schools or wraparound-services approaches are seeing only modest or mixed academic results.

First, given the wide range of model types within this category and the fact that different schools and communities face different needs and have different partnership opportunities available to them, it is not surprising that there would be a wide range of results, which makes saying whether a community-schools approach "works" both impossible and too simplistic.

Second, it may be that these schools are providing the right nonacademic services and supports for their students, but aren't doing enough on the academic side to close the achievement gap. Consider, for example, how IKEA can't simply offer quality and convenient food service in its cafeteria alongside low-cost furniture if it wants to help people furnish an apartment in one day. It also has to focus on the easy-to-retrieve-and-assemble furniture to get the ultimate job done. Similarly, schools providing wraparound services should not simply provide services for their own sake. Rather, they must do so in the service of student learning to get the academic job done. As Michael J. Petrilli, president of the Thomas B. Fordham Institute, said, "Yes, absolutely, let's make sure that we provide strong social supports for disadvantaged children, but let's not use that as an excuse to ignore what's happening or what's not happening inside

"It's rare that you can tinker with the outcomes of a particular player and how they might deliver their services because the design is either dependent on how their funding flows or on their model design."

—Daniel Cardinali, president, Communities In Schools

of the school."[44] Coordinated service provision, in other words, may be a necessary but not sufficient driver of academic success. Marty Blank, head of the Coalition for Community Schools, has observed as much, as he has pointed out that community schools require shifts not only in how service providers organize themselves, but also in how the academic side of the house delivers learning and how families engage in the school.[45]

Third, the theory of interdependence and modularity allows us to see that a number of community-schools models may not be sufficiently interdependent or backward integrated to address fully the challenges of closing the achievement gap. Given their focus on coordinating outside service providers, rather than fully controlling the delivery, mix, and structure of the wraparound services offered, community schools may be unable to craft a coherent model that works well to serve its students' varying and often unpredictable needs.

One reason these organizations may struggle to create a more interdependent model is that in a world of uncertainty over what leads to successful student outcomes, coordinating the staffing structures and incentives for different organizations is difficult. At minimum, each community school must employ a strong, dedicated social-service coordinator.[46] According to Dan Cardinali, president of CIS, the more central role a site coordinator plays at the school, the better. "At best the coordinator sits on the management team with teachers and principals. Even the location of a coordinator's desk or office can be telling," Cardinali said. If, for example, the coordinator sits near or among the school's administrators, it's more likely that he is an integrated part of school-wide decisions and strategies.[47]

Coordinated service provision may be a necessary but not sufficient driver of academic success.

Even with a well-integrated site coordinator, however, school systems themselves may remain relatively inflexible institutions that are not particularly permeable to new integrations or interdependent design. There are several reasons for this—from longstanding processes and priorities that have become rigid[48] to public policies that thwart the design of authentically interdependent architectures in community-schools or wraparound-services models. As one superintendent told us, the Health Insurance Portability and Accountability Act (HIPPA) and Family Educational Rights and Privacy Act (FERPA) make sharing information between school and health care providers nearly impossible, even if health care providers are co-located on site. Because these policies can be construed to limit educators from sharing students' academic schedules, for example, even basic efforts such as scheduling students' doctor's appointments during the school day can become difficult. Students may then be pulled out of core academic courses for routine check ups that should occur in a manner that does not disrupt learning.

Policies like these, while prudent in their intent, may erect substantial barriers to creating an interdependent architecture among discrete providers in schools pursuing a partnership model. The same is true, of course, for other service providers, which are often not set up to customize for particular schools or circumstances. As Cardinali said, "By and large, most providers are drop and play. … It's rare that you can tinker with the outcomes of a particular player and how they might deliver their services because the design is either dependent on how their funding flows or on their model design."[49]

Educators should heed the warning. Although schools may be tempted to adopt "partnership" solutions—as they will often seem both simpler and cheaper—a partnership model may fall short of the interdependent architecture that would allow schools to tweak the design and delivery of services needed to drive breakthrough outcomes.

HARLEM CHILDREN'S ZONE AND PROMISE NEIGHBORHOODS: A "CONVEYOR BELT" APPROACH TO STUDENT SUPPORTS

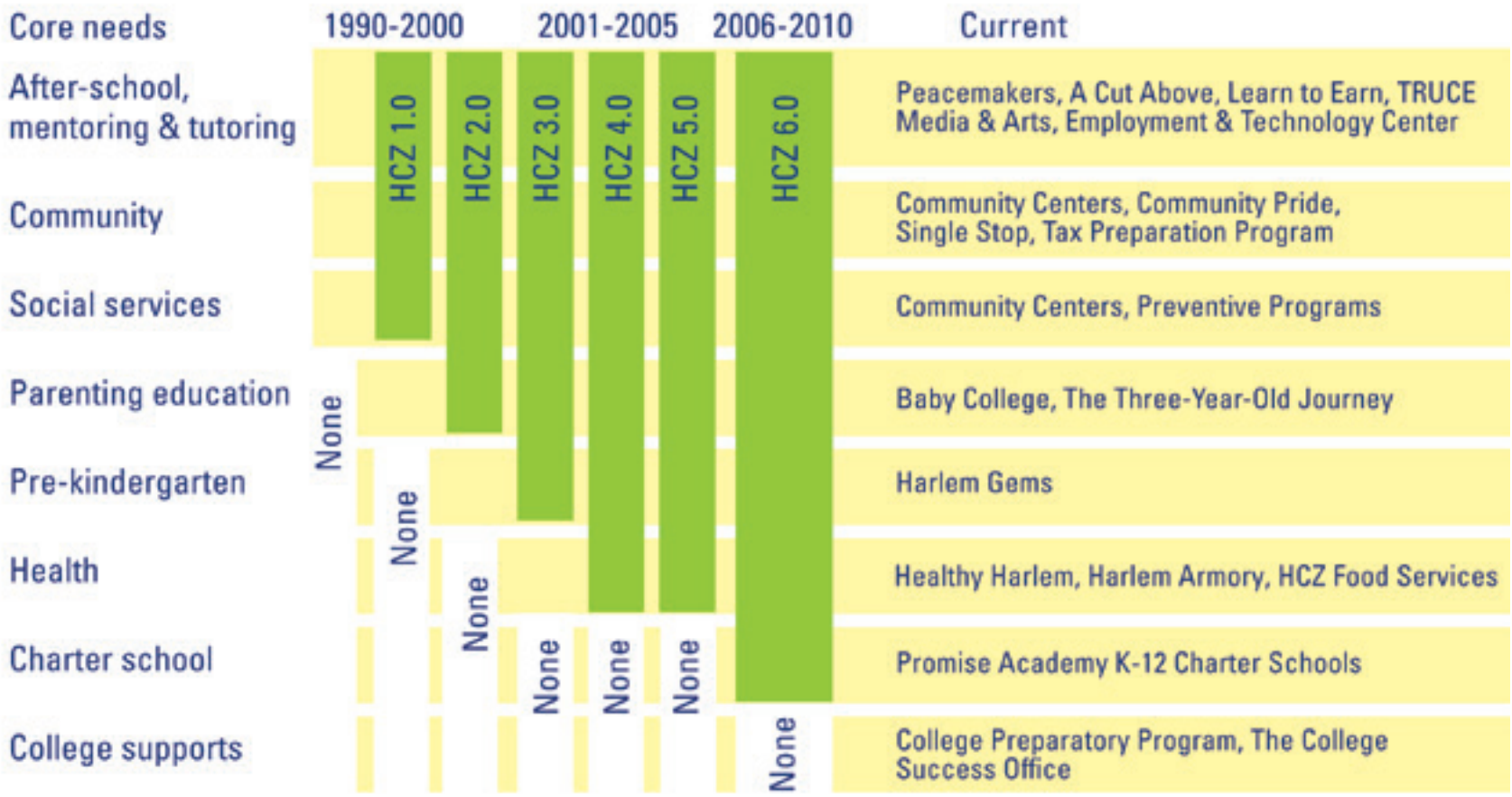
The Harlem Children's Zone (HCZ) is a nonprofit organization that provides a range of services to children and families in the Harlem neighborhood in New York. HCZ's original parent organization, called the Rheedlen Centers for Children and Families, was founded in 1970 and gave rise to the HCZ Project in the late 1990s. An early business plan for the now highly acclaimed HCZ stated that "it is difficult, often impossible, to raise healthy children in a disintegrated community."[50] HCZ focuses on the tight integration of various family and children's services, as well as on integrating community members themselves around a common goal.

THE MODEL

Not merely a school, in its earlier years, HCZ's stated mission was "to improve the lives of poor children in America's most devastated communities." This, too, was a shift from the original mission of the organization, which aimed to work with the bottom 15 percent of students in public schools. As Geoffrey Canada, president of HCZ, explained in a 2002 interview in *Philanthropy News Digest*, the organizational mission shifted, as the troubles of this lower performing group became better understood. "[A]s the number of kids in that bottom group began to grow, we realized that we needed to expand our services," he said. HCZ eventually decided to double down efforts on a particular 24-block "zone" in Harlem, between 116th and 123rd streets and Fifth and Eighth avenues, because it felt the need to contain its efforts in order to deepen and track interventions. As Canada said, "If you start talking about how you're going to save most children, you have to do all those things, and do them over the long term, and you have to make sure you can count how many children actually received those services."[51]

HCZ has since expanded to serving a 97-block zone and refined its mission to focus on college success as the program's unifying goal. According to the organization's website, "We [HCZ] track 600 goals each year and are constantly gathering data and reviewing our results to ensure that our kids stay on track toward the ultimate goal—college graduation." To get children to this goal, HCZ offers a broad range of programs that have continued to expand as the organization tries to tackle the various sides of poverty and child development. Canada is well known for likening the approach to a "conveyor belt," such that the Zone offers an "interlocking sequence of core programs designed to ensure that children are supported consistently through every phase of development."[52] For example, in 2000, HCZ began offering The Baby College parenting workshops; in 2001, it introduced the Harlem Gems preschool program; in 2004, it opened its first Promise Academy Charter School; and in 2012, it began implementing Healthy Harlem, a cross-site initiative to combat obesity and foster healthy habits throughout the Zone.[53] In other words, as HCZ's mission shifted to college success, the organization continued to integrate additional services aimed at accomplishing that specific goal. *Figure 3* illustrates how HCZ's suite of services has grown over time to target additional needs in the community.

Figure 3. The evolution of Harlem Children's Zone*



* This chart was adapted from Wrede Petersmeyer, Behrad Mahdi, Mandeep Rai, and Assaf Harlap, "Shirking Charybdis: The Challenge of Building and Sustaining a Successful Social Enterprise," Harvard Business School, BSSE final paper, December 2009.

Results and analysis

The results of HCZ's efforts are encouraging but mixed. In 2009, two Harvard researchers, Roland Fryer and Will Dobbie, analyzed academic achievement data from the two charter schools that HCZ operates, Promise Academies I and II, both of which have posted positive student outcomes in the years since their founding. A lottery system determines who can enroll in a charter school in New York City. The researchers compared the outcomes among lottery winners living close to the Zone with those living far from it, based on the assumption that the closer a student lives to the Zone, the more likely he and his family are to take advantage of the Zone's programs and services.[54] They also compared lottery entrants' outcomes with those of their siblings who did not attend the Promise Academy schools because of their age, but who received a number of Promise Academy's nonacademic services by virtue of being students' siblings.[55] Both comparisons showed little effect of the nonacademic HCZ services—either by virtue of living closer to the Zone or of being a sibling who had access to those services—which suggests that the Promise Academies' school-based approach drives the positive student outcomes. The researchers, along with a series of commentators on the study, concluded that the in-school efforts of the Promise Academies alone—not the outside wraparound services—were driving academic achievement.[56] They speculated that this finding, along with other research, suggests "a better community, as measured by poverty rate, does not significantly raise test scores if school quality remains essentially unchanged."[57]

Some have taken this study to argue that this shows, as the Thernstroms posit, that schools matter, not expensive wraparound services. But this explanation falls short because the efforts *within* those schools still reflect an effort to integrate backward, much as KIPP has done. As Fryer and Dobbie summarize:

> Promise Academy has an extended school day and year, with coordinated after-school tutoring and additional classes on Saturdays for children who need remediation in mathematics and English Language Arts skills. ... The schools provide free medical, dental and mental-health services (students are screened upon entry and receive regular check-ups through a partnership with the Children's Health Fund), student incentives for achievement, nutritious cafeteria meals, support for parents in the form of food baskets, meals, bus fare, and so forth, and less tangible benefits such as the support of a committed staff. The schools also make a concerted effort to change the culture of achievement, emphasizing the importance of hard work in achieving success.[58]

"If you start talking about how you're going to save most children, you have to do all those things, and do them over the long term, and you have to make sure you can count how many children actually received those services."

—Geoffrey Canada, president, Harlem Children's Zone

In other words, champions of "school-based reform" should not gloat based on the seeming suggestion that HCZ's community-based poverty relief efforts did not bear out in the study: in fact, the Promise Academies themselves borrowed from Canada's original vision and integrated numerous nonacademic poverty relief efforts into their own school buildings. In other words, Fryer and Dobbie's work suggests that in targeting the "job" of academic success, Promise Academies integrated backward to serve students. That the students' siblings could also access some of these services but did not have the same academic outcomes is not necessarily an indictment of the need for the nonacademic services, but instead points to those services being necessary but not sufficient—and likely necessary as part of an integrated offering targeted at bolstering academic outcomes.

This conclusion then suggests that other services that HCZ provides may not be optimized around helping students achieve academic success. Other HCZ services beyond Promise Academies may instead be integrated around solving different problems that would be better measured by different indicators than the academic achievement metrics that Dobbie and Fryer tracked. Indeed, these additional wraparound services may be optimizing on health and wellness or safety measures that do not, by themselves, impact test scores, at least in the short term.[59] Alternatively, it is possible that HCZ's non-school wraparound services are not integrated correctly in an overall interdependent architecture that optimizes community members' outcomes, including students' academic outcomes. For example, because Canada's theory of building a cradle-to-career "conveyer belt" to transport children from birth to adulthood tends to define service provision in terms of community member's life stages as opposed to the human circumstances in which they find themselves, HCZ may have erected modular interfaces between distinct services too early in its development.

Additionally, there is no saying whether the benefits of HCZ's community-based interventions may play out down the line in breaking the cycles of poverty in Harlem; if they do, then it might call into question some of researchers' assumptions around measures of academic achievement and poverty. Additional metrics and more extensive longitudinal measures for individual families that take a longer view may be needed to capture the benefits of wraparound services provided to children and families within the Zone.[60]

Despite the whole-community model's mixed results in driving student achievement, there is a growing effort to replicate HCZ's approach. In 2007, prior to being elected President, President Obama praised HCZ as "an all-encompassing, all-hands-on-deck, anti-poverty effort that is literally saving a generation of children."[61] His Administration created the Promise Neighborhoods grant program, overseen by the U.S. Department of Education's Office of Innovation and Improvement, which funds communities attempting to borrow from HCZ's integrated service delivery model.

There are two significant reasons to worry about this effort.

First, critics have pointed out that many of the new Promise Neighborhoods receiving grants are attempting to replicate HCZ's wraparound community

A consortium of arms-length players tackling challenges within a community is unlikely to generate results given the unpredictable interdependencies between the services that touch the lives of many families today.

programs without reproducing its high-performing charter schools, which runs counter to Fryer and Dobbie's findings.[62] Efforts to scale HCZ will also likely call for a degree of data integration that most cities and schools are not accustomed or equipped to perform. HCZ's goals align with various metrics—not all of which are measured easily or even collected in most schools and cities.[63] This may limit Promise Neighborhood grantees from pursuing the integrated, data-driven practices that have guided HCZ's strategy over the years.

Second—and, in light of the theory, perhaps most worrisome—the majority of the grantees do not appear to be as fully integrated or interdependent as HCZ's programs. They instead operate more like partnership coordinators across various providers in their cities and neighborhoods. If the goal is to boost low-income students' academic results, then this approach almost certainly lacks the level of integration required to achieve success given the level of unpredictable interdependencies that still exist among the various services that students need. Not being required to replicate the interdependent architecture and services offered by institutions, like the Promise Academies, that bolstered academic achievements is, at this stage, problematic. Of course, Promise Neighborhood grants could go toward helping the grantees perform different jobs in the lives of the families they serve that have different goals and metrics of success. But being clear on what these jobs are is critical so that the grantees can integrate properly around that job. A consortium of arms-length players tackling challenges within a community is unlikely to generate results given the unpredictable interdependencies between the services that touch the lives of many of these families today.

THE SEED SCHOOLS: INTEGRATING SCHOOL AND HOME

SEED is a public college preparatory boarding school founded in 1997 in Washington, D.C. It now has campuses in Maryland and Florida as well. The school serves primarily low-income minority students in grades 6–12. With its public boarding school model, SEED represents one of the furthest integrated models available to students today, as students live on SEED's campus five days a week and go home only on weekends—a significant backward integration into what would ordinarily be students' home lives. Therefore, all of the additional supports that SEED has integrated into its model extend for more hours, with fewer outside variables, than the other schools described here.

The model

Like KIPP and HCZ's Promise Academies, SEED's approach largely resembles the "no excuses" model, as it offers extended instructional hours and a highly disciplined school culture oriented around academic achievement. The school also avoids social promotion; for example, 8th graders who need more time to master grade-level skills can take a "growth year" during middle school. The SEED team has also developed a character education approach that it has dubbed HALLS—Habits for Achieving Life-Long Success. The approach developed over time as the school staff encountered various shortcomings in students' lives that inhibited their success. HALLS is a curriculum that teaches study skills, effective time management, interpersonal communication, and other life skills to help students succeed in their educational, personal, and professional endeavors. The HALLS curriculum has evolved over time. As Bill Stevens, who has taught history at SEED since 2000, told Whitman, "...the longer SEED has been here, the more the core value statements have taken on real value. There hasn't always been a consistent way of teaching respect or compassion."[64]

Even more than simply teaching "character" in an academic setting, SEED takes this approach into its residential setting as well. Discovering that residential living presents a host of challenges with which day schools do not have to—and cannot—deal, SEED has attempted to codify clear rules for every eventuality. Its 2006–07 parent-student handbook is 61 pages single-spaced with extremely detailed instructions on how students must conduct themselves. For example, one rule says, "Shoes must be stored neatly under hanging racks, under the bed, or next to the dresser or the desk."[65] Mastering these competencies is also required for promotion from 8th grade to high school.

Additional youth services extend into the residential setting as a result of SEED's 24-hour model. For example, in the Mental Health Department at The SEED School of Washington, D.C., counselors are available between 7 a.m. and 10 p.m. There are also afterschool homework hours during which students can complete homework in their dorm rooms or in one of the common study spaces available throughout the dormitory. There is a computer in each dorm room as well as in the common areas, and the residential staff are available during homework hours to answer questions.[66]

SEED's model would be best suited to serving the most demanding, highest need students.

Results and analysis

Evidence from quasi-experimental studies suggests SEED is driving impressive outcomes for students accepted through the lottery in comparison to those who were not. In 2011, researchers Vilsa Curto and Roland Fryer found that lottery estimates reveal that SEED schools are effective at increasing the achievement of the poorest minority children. The effects they found were enough to close the black-white achievement gap in both English Language Arts and math in four years. The researchers noted that these results are in line with those found in similar studies of "no excuses" schools, but that SEED posts greater increases in reading scores.[67] SEED also has one of the highest college enrollment rates of any inner-city school in the country.[68] SEED, however, according to Whitman, posted a higher dismissal rate than its nonresidential peer charter institutions: 5.6 percent of its students each year, on average, compared to 1.8 percent at other charter schools.[69]

In many ways, SEED represents the most highly interdependent paradigm of those models combining academics and additional student supports described in this paper. As such, it follows that SEED's model would be best suited to serving the most demanding, highest need students. And SEED does specifically target these students both in its recruitment efforts and policies by cultivating local partnerships with service providers that can identify and recommend high-need students. SEED also creates eligibility criteria—such as involvement with the social service system, failure to achieve proficiency on state tests, a record of multiple suspensions or chronic truancy, having an incarcerated family member, or living below poverty guidelines—to drive enrollment to those with the greatest need. Because SEED operates a public lottery for admission to its schools, specific eligibility criteria are determined through contract negotiations with states. As a result, each school's criteria looks slightly different. In Miami, for example, under law, SEED has reserved 20 spots in its 6th-grade class for children receiving services under the child welfare system. It holds a separate lottery for those 20 spots.

The concept of a boarding school for low-income minority youth is unsettling for some. As Whitman wrote, "For decades, Americans have been of two minds about such schools. They believe that boarding schools are stepping stones to privilege for the children of America's elite ... Yet they imagine that residential programs for low-income students are reserved for troubled adolescents and wards of the state."[70] Stereotypes aside, the theory we present here suggests that the most highly interdependent school model is best suited to the most demanding students.[71] As SEED co-founder and CEO Rajiv Vinnakota said, "We believe that there are certain students who need a 24-hour environment to reach their full potential. With our boarding program, we are able to ensure that our students have access to the resources and support they need to succeed." Indeed, this can only be accomplished if a school, such as SEED, can successfully attract and retain such students and if policies allow for appropriate eligibility criteria in order to focus on high-need populations.

LOOKING AHEAD: INTERDEPENDENCE, MODULARITY, AND SCALE

The examples above illustrate a range of school models developing across the U.S. K–12 education system that incorporate services not traditionally found in schools. The theory of interdependence and modularity offers more insight as to why certain models are or are not seeing success that goes beyond the existing framing of whether schools merely offer "nonacademic," "wraparound," or "integrated student supports."

Even if we were to agree that more services—and greater control over how those services are delivered and evaluated—would be key to overcoming the achievement gap, how plausible would it be that school systems would actually implement these approaches? Can schools actually push for more deeply integrated delivery models? Can schools already pursuing these models scale their efforts?

Perhaps. But we would be remiss to ignore the common critiques and doubts levied against the viability and value of highly integrated education and social services models. First, even advocates of these models point out that existing public institutions are rigid and impermeable to integrated, interdependent architectures—hence, the partnership models popular among community-schools advocates. Second, critics of such models often insist that these student-centered approaches to provide nonacademic supports are far too expensive. Third, critics likewise question the scalability of the models themselves, in light of factors like human capital burn out, student attrition, and creaming. For example, as Rothstein wrote about KIPP, "No educational model, however, can assume that all teachers will be forever young, working extraordinary hours and never expecting salary growth that typically comes with years of experience and that enables teachers to support a middle-class family life."[72] A fourth critique to integrating poverty relief efforts into the domain of schools is that we will further segregate the education system. That is, if we are designing institutions suited specifically to serving the highest need students, then those institutions stand to isolate already marginalized groups.

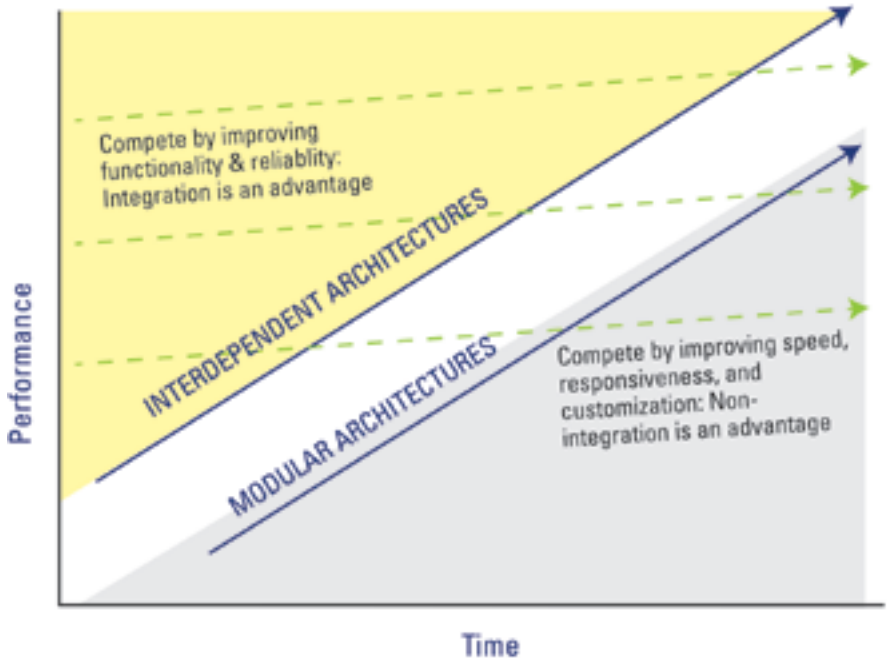
Although valid, these critiques take a myopic view of what more integrated approaches could lead to in the long run. Across numerous industries, seemingly less-efficient integrated systems typically, over time, give way to modular ones that are more affordable. This occurs because as they continuously integrate to drive performance, interdependent approaches eventually overshoot their performance goals. Ultimately, companies that race to make the best possible products find that they are making products that are too good—that is, the products' performance and cost exceeds what customers are willing to buy. When that happens, as Clayton Christensen and Michael Raynor wrote, "the intricate fabric of success of integrated companies like these begins to unravel."[73]

This unraveling leads to a more modular world in which an organization can prosper by outsourcing or supplying just one element, or subcomponent, of a product or service. *Figure 4* illustrates how this process unfolds as integrated organizations overshoot the performance users need. Ultimately, the specification for modular interfaces will coalesce as industry standards. This evolution from integration to modularity typically occurs in stages: for

Ultimately, the specification for modular interfaces will coalesce as industry standards.

example, as the performance of its mainframes improved, IBM moved gradually from a highly integrated production model to a modular world, but it still controlled the interfaces against which it outsourced production. Only later, and in a piecemeal fashion, did the introduction of the Mainframe 360 allow for peripherals like printers and readers to become modular. This, in turn, gave rise to an entire market of suppliers that specialized in building these specific devices. The more that there are defined and codified modular interfaces across industries, the more companies are able to mix and match components from best-of-breed suppliers in order to respond conveniently to the specific requirements of individual customers. With modular solutions, companies can also scale production far more quickly, without dramatically increasing costs. In general, industries will fluctuate between interdependent and modular architectures depending on whether they are seeking to maximize performance (integrated architectures) or customizability (modular architecture).

Figure 4. Circumstances that give rise to interdependent versus modular architectures



Even studies that home in on a subset of variables still tend to identify a "cocktail" of various interventions that appear to make the "no excuses" model successful; none have been able to isolate those variables or define the particular contexts in which individual variables are driving outcomes versus others.

As critics point out, integrating academic and nonacademic systems appears to be far less efficient than the current disintegrated, or modular, models wherein we outsource services to discrete agencies and providers. But from an overall sector perspective, the apparent inefficiencies of investing in more integrated, interdependent models and duplicating some of these agencies' efforts may be both temporary and necessary to avoid the waste and inefficiency that result from the predictably poor outcomes from premature modularization. As the challenge of closing the achievement gap persists, we are likely in a not-good-enough circumstance that calls for more integrated approaches that are indeed costly—but not as costly from a systematic perspective as the alternative, in which the costs are hidden from the financial statements of any one organization. This also does not mean that in the future we cannot move toward a more modular and efficient solution that works to educate students of all backgrounds. To get there, we will need to continue to improve interdependent systems until they "overshoot" performance, at which point the theory predicts that a more modular system will begin to emerge. Stated differently, this system will emerge once we have a clearer understanding of what particular mix of supports can effectively drive student success, particularly among poor and minority youth. The emergence of a modular world that works could assuage Rothstein's and other critics' concerns about scalability and sustainability of the current, largely chartered models that are gaining some academic traction by leveraging backward integrations.

The apparent inefficiencies of investing in more integrated, interdependent models and duplicating some of these agencies' efforts may be both temporary and necessary to avoid the waste and inefficiency that result from the predictably poor outcomes from premature modularization.

Why is a modular world currently out of reach? Despite research into what drives student success, in the complex arenas that affect academic achievement, causal factors are not yet sufficiently well understood to introduce a fully modular school system with predictable, standardized interfaces. Indeed, the poverty versus schools debate illuminates researchers' poor understanding of what exactly *causes* the achievement gap. In *No Excuses: Closing the Racial Gap in Learning*, the Thernstroms blame "culture" as the leading cause of the persistence of the achievement gap. In *Class and Schools: Using Social, Economic, And Educational Reform To Close The Black-White Achievement Gap*, Rothstein looks at similar data sets but comes to a different conclusion: poverty is at the root of enduring achievement gaps. Both, however, make these inferences based on correlations. Neither can prove causality between the factors they highlight and persistent gaps.

Other researchers' efforts to learn from various successful interventions reflect a similar lack of causal understanding. For example, researchers trying to unpack charter school data have found that given the small size of the correlations of impact with program variables, the reasons that some KIPP schools are more effective than others are not presently well understood.[74] Even studies that home in on a subset of variables still tend to identify a "cocktail" of various interventions that appear to make the "no excuses" model successful; none have been able to isolate those variables or define the particular contexts in which individual variables are driving outcomes versus others.[75] And recent research has even shown that although these schools are managing to drive up test scores at astonishing rates, they may not be effective at boosting underlying "fluid" cognitive skills that would make students more effective learners.[76] Studies of integrated wraparound-services provision likewise tend to test the effectiveness of a bundle of services, rather than the effects of individual services—or the relationships between specific services—within that bundle.[77]

The world of education for the highest need students may indeed become modular, but not until we can specify exactly how we are serving students in terms of causation, rather than merely correlation. If we look to how industries outside of education have evolved from an interdependent to a modular architecture, these interfaces will emerge only when integrated players begin to over-serve students and families: at that point, the more modular, discrete needs of different customers will reveal themselves and begin to break apart the holistic package of services that such integrated institutions are delivering.[78]

CONCLUSION: INTEGRATING BACKWARD TO MOVE FORWARD

As organizations, like those described here, integrate actively, we will likely start to see more results that illustrate how to drive performance through interdependent architectures. As performance improves, we should also begin to define modular interfaces that render scale possible and affordable. It bears noting that we are not recommending that education policies start grading or evaluating schools or educators on how they deliver health care, support services, and the like. Not only has society already layered more jobs on public schools than was ever contemplated at their origins—hence complicating greatly their operations—the theory of interdependence and modularity also suggests that simply layering or cramming more services on top of existing models will not predictably boost outcomes. Instead, in order to meet the academic goals society holds for students, different schools will need to integrate backward to provide nonacademic services in different ways based on the specific communities and students they serve.

Many schools may see integrating backward to provide more nonacademic supports to their students as a challenge given tight budgets, limited resources, and longstanding processes and culture. Indeed, the schools serving many of the highest need students may find themselves most strapped for discretionary dollars.[79] Developing deeper integrations, however, may be possible by deploying resources in new ways. As certain services are commoditized and delivered in new ways, time and resources could be freed up to deliver nonacademic services. For example, developments in blended learning suggest that some features of academic content and delivery are gradually becoming commoditized—that is, students may be able to work online to master some skills and content at lower costs than traditional offline instruction. This may free up resources to dedicate to other, valuable nonacademic services and supports, either by investing in additional services or repurposing teachers to provide non-cognitive lessons, mentoring, and guidance.[80]

As technology continues to develop, the possibility of a more personalized, customizable version of schooling feels more and more within reach. When we look into the future of what school could be, we imagine something like a community center with a range of academic, health, and support services available to students. In this new system, services and academics alike could be doled out in a flexible manner, with different resources, schedules, and supports for different students. This could, in turn, facilitate more racial and socioeconomic integration than we see in schools today. To remain efficient and expand opportunities and choice, such a schooling

As technology continues to develop, the possibility of a more personalized, customizable version of schooling feels more and more within reach.

system could welcome a range of providers that could plug into various interfaces at that schooling hub. Some students would still rely more on the services a school provides than others would, but the school would be positioned to serve many more types of students based on their needs.

This all sounds well and good, but a large part of the problem in realizing this vision is that the current system has not integrated far enough to eventually flip to this more customizable vision of the world. Schools—particularly those serving high-need students—cannot skip the early stages of integration in which companies, like IBM, had to engage in order to drive performance. The Thernstroms and Rothstein camps may continue to argue back and forth about different discrete interventions to best chip away at the achievement gap, but if we want to realize ultimately this modular and flexible vision for the highest need students, it is unlikely that we will get there without first developing, tweaking, and studying highly integrated approaches that combine academic and nonacademic supports.

NOTES

1 Abigail and Stephen Thernstrom, *No Excuses: Closing the Racial Gap in Learning* (New York: Simon & Schuster, 2003).

2 Richard Rothstein, *Class and Schools: Using Social, Economic, and Educational Reform to Close the Black-White Achievement Gap* (Washington, D.C.: Economic Policy Institute, 2004), p. 9.

3 Rothstein, p. 72.

4 Rothstein, p. 37.

5 "Secretary Duncan Announces Seventeen 2012 Promise Neighborhoods Winners in School Safety Address at Neval Thomas Elementary School," U.S. Department of Education, December 21, 2012, http://www.ed.gov/news/press-releases/secretary-duncan-announces-seventeen-2012-promise-neighborhoods-winners-school-safety-address-neval-thomas-elementary-school (accessed April 27, 2015).

6 "U.S. Department of Education Announces Grants Totaling More than $14.4 Million to Charter School Management Organizations," U.S. Department of Education, September 27, 2012, http://www.ed.gov/news/press-releases/us-department-education-announces-grants-totaling-more-144-million-charter-school-management-organizations (accessed April 27, 2015).

7 See, for example, Javier C. Hernández, "Mayoral Candidates See Cincinnati as a Model for New York Schools," *New York Times,* August 11, 2013, http://www.nytimes.com/2013/08/12/nyregion/candidates-see-cincinnati-as-model-for-new-york-schools.html (accessed April 27, 2015); "The All-in-One School Goes National," Marketplace, June 6, 2013, http://www.marketplace.org/sites/default/iframes/oneschool/national.html (accessed April 27, 2015); and "Full Service Community Schools Program," U.S. Department of Education, http://www2.ed.gov/programs/communityschools/index.html (accessed August 29, 2014).

8 Full-Service Community Schools Act of 2014, H.R.5168, 113th Cong. (2014), https://beta.congress.gov/bill/113th-congress/house-bill/5168 (accessed April 27, 2015).

9 It is worth noting that although delivering academic content has remained the central province of schools, the responsibility on schools to provide "care" may have grown over time across all schools as the labor market has shifted. In research for the Clayton Christensen Institute, Adjunct Fellow Mallory Dwinal explains:

> At the same time that the women's liberation movement decreased the quantity and average quality of the teacher labor supply (particularly in subject areas with readily transferable skills), it also increased the demand for teachers, albeit in subtler ways. Increased professional opportunities over the past few decades upset the prevalence of the "single breadwinner" household, such that significantly fewer children now have a full-time, stay-at-home parent. As this shift occurred, schools became the provider of "substitute services" for parental socialization, which placed additional responsibilities on teachers and staff. Schools required more staff members to meet these expanded responsibilities and, as a result, student-teacher ratios fell from 22.3-to-1 in 1970 to 15.4-to-1 in 2009. As further evidence of this trend, the *Wall Street Journal* reported in 2012 that, over that same time period, school-level employment grew 11 times faster than student enrollment in K–12 schools.

Mallory Dwinal, "Solving the nation's teacher shortage: How online learning can fix the broken teacher labor market," Clayton Christensen Institute, March 2015, http://www.christenseninstitute.org/wp-content/uploads/2015/03/Solving-the-nations-teacher-shortage.pdf.

10 It is worth noting here that sustaining innovations that improve performance over time are vital to the space of education reform. Our work is often perceived as calling exclusively for disruptive innovation, but this is a misreading of the theories. Indeed a healthy marketplace needs both sustaining and disruptive innovations. In the instances described here, sustaining innovations—that improve school performance, particularly in serving low-income students—will be vital to moving integrated solutions up the performance curve. Such sustaining innovations may include blended-learning models that allow for a greater degree of personalization of path and pace for students. For example, the Station Rotation and Lab Rotation models are both sustaining innovations to the traditional classroom that have the potential to make learning more effective and efficient. Clayton M. Christensen, Michael B. Horn, and Heather Staker, "Is K–12 blended learning disruptive? An introduction of the theory of hybrids," Clayton Christensen Institute, May 2013,

http://www.christenseninstitute.org/wp-content/uploads/2013/05/Is-K-12-Blended-Learning-Disruptive.pdf.

11 Reuters, "IBM Sells $300 million of Intel Shares, Ending Stake in Supplier," *Los Angeles Times,* August 29, 1987, http://articles.latimes.com/1987-08-29/business/fi-1393_1_intel-corp-shares (accessed April 27, 2015).

12 In *The Innovator's Solution*, Clayton Christensen and Michael Raynor explain:

> If an institution or company must introduce a breakthrough technology or service to serve more demanding customers who are presently under-served by the existing options, it likely needs to be highly integrated in order to control all of the design elements. The use of advanced ceramics materials in engines, the deployment of high-bandwidth DSL lines at the last mile of the telecommunications infrastructure, the building of superconducting electric motors for ship propulsion, and the transition from analog to digital to all-optical telecommunications networks were only accomplished by extensively integrated companies.

Clayton M. Christensen and Michael E. Raynor, *The Innovator's Solution* (Boston: Harvard Business School Press, 2003), p. 130.

13 Clayton M. Christensen, Jerome Grossman, Jason Hwang, *The Innovators Prescription* (New York, McGraw Hill, 2009), p. 212.

14 In *No Excuses: Closing the Racial Gap in Learning,* Abigail and Stephen Thernstrom explain:

> It's a remarkable turn of events. The racial gap—hidden from public view until so recently—has suddenly acquired top billing in the national educational agenda. In 1965, ESEA was the product of concern about poverty; it was part of President Johnson's War on Poverty. By 2001, the White House, members of Congress in both parties, and important players in the business and educational communities had come to view the academic performance of black and Hispanic students as a distinct—and distinctly urgent—problem.

Thernstrom and Thernstrom, p. 24.

15 "Have achievement gaps changed?" Student Group, NSLP, National Assessment of Educational Progress, http://www.nationsreportcard.gov/reading_math_2013/#/achievement-gaps (accessed April 27, 2015). See also "Income Eligibility Guidelines," Federal Register, Vol. 79, No. 43, March 5, 2014, http://www.fns.usda.gov/sites/default/files/2014-04788.pdf.

16 According to the KIPP Foundation:

> There are currently 162 KIPP schools in 20 states and the District of Columbia serving 58,000 students. More than 88 percent of our students are from low-income families and eligible for the federal free or reduced-price meals program, and 95 percent are African American or Latino. Nationally, more than 93 percent of KIPP middle school students have graduated high school, and more than 82 percent of KIPP alumni have gone on to college. There are 80 KIPP middle schools (grades 5–8), 60 elementary schools (grades PK–4), and 22 high schools (grades 9–12). Students are accepted regardless of prior academic record, conduct or socioeconomic background.

"About KIPP," KIPP Foundation, http://kipp.org/about-kipp (accessed September 4, 2014).

17 "Our Approach," KIPP Foundation, http://www.kipp.org/our-approach#sthash.tqZ0Mbeh.dpuf (accessed September 4, 2014).

18 Whitman, p. 118.

19 Rothstein argues that out-of-school time exacerbates achievement gaps: "This difference is exacerbated during the years that children spend in schools, but during these years the growth in the gap occurs mostly in the after-school hours and during the summertime, when children are not actually in classrooms." He also argues, however, that KIPP's approach to extended school days and enrichment activities is not scalable. Rothstein p. 10.

20 Whitman, p. 53. It is important to note, however, that recent research and reporting call into question the degree to which KIPP students' attitudes are actually changing. A recent Mathematica Policy Research study found that "KIPP children showed no advantage on any of the measures of character strengths." Laurence Steinberg, "Is character education the answer?" Thomas Fordham Institute Flypaper, September 17, 2014, http://edexcellence.net/articles/is-character-education-the-answer (accessed April 27, 2015). Additionally, in some regions, KIPP and similarly operated "no excuses" schools have seen backlash against their discipline and suspension policies. See, for example, Sarah Carr, "The painful backlash against 'no-excuses' school discipline," *The Hechinger Report,* November 17, 2014, http://hechingerreport.org/content/painful-backlash-excuses-school-discipline_18023/#.VGqmT3SMCjk.twitter (accessed April 27, 2015).

21 Dave Levin, "Fake it 'till you become it…," KIPP Blog, November 1, 2012, http://blog.kipp.org/developingcharacter/%E2%80%9Cfake-it-%E2%80%98till-you-become-it-%E2%80%9D/ (accessed April 27, 2015).

22 In a *New York Times Magazine* article, Paul Tough explains:

> ...students at both KIPP and Achievement First schools follow a system for classroom behavior invented by Levin and Feinberg called Slant, which instructs them to sit up, listen, ask questions, nod and track the speaker with their eyes. ... Levin's contention is that Americans of a certain background learn these methods for taking in information early on and employ them instinctively. KIPP students, he says, need to be taught the methods explicitly.

Paul Tough, "What It Takes to Make a Student," *New York Times Magazine*, November 26, 2006, http://www.nytimes.com/2006/11/26/magazine/26tough.html?pagewanted=all&_r=0 (accessed April 27, 2015).

23 Elliot Whitney, "Explaining KIPP's 'SLANT,'" *Education Week*, April 11, 2013, http://blogs.edweek.org/edweek/Bridging-Differences/2013/04/slant_and_the_golden_rule.html (accessed April 27, 2015).

24 Whitman, p. 167.

25 Whitman, p. 188.

26 Whitman, p. 188.

27 "Frequently Asked Questions," KIPP Foundation, http://www.kipp.org/question3 (accessed September 4, 2014).

28 Caleb Dolan, email to the author, April 29, 2015.

29 Jennifer Radcliff, "KIPP schools to open clinic for students," *Houston Chronicle*, August 11, 2013, http://www.houstonchronicle.com/news/houston-texas/houston/article/KIPP-schools-to-open-clinics-for-students-4724704.php (accessed April 27, 2015).

30 In a Mathematica Policy Research study, the authors note: "We ... found that, while KIPP schools 'backfill,' or admit a substantial number of late entrants in grade 6, they admit

fewer new students in grades 7 and 8 than do nearby district schools." Christina Clark Tuttle, Brian Gill, Philip Gleason, Virginia Knechtel, Ira Nichols-Barrer, and Alexandra Resch, "KIPPMiddle Schools: Impacts on Achievement and Other Outcomes," Mathematica Policy Research, February 27, 2013, p. 22, http://www.mathematica-mpr.com/~/media/publications/PDFs/education/KIPP_middle.pdf.

31 Lee Benson, Ira Harkavy, Michael C. Johanek, and John Puckett, "The Enduring Appeal of Community Schools," *American Educator,* Vol. 33, No. 2, 2009, pp. 22–47, http://www.aft.org/pdfs/americaneducator/summer2009/enduringappeal.pdf.

32 There is no fixed definition of the spectrum of activities and services that a community school might engage in. As researchers from the University of Maryland pointed out in a 2014 review of the literature on community schools, models fall into four categories along this spectrum:

School Based Partnerships			Placed Based
Family/Interagency Collaboration	**Full-Service Schools**	**Full-Service Community Schools**	**Community Development**
• Coordinate service delivery • Promote student learning & development • Set specific and limited goals	• Deliver school-based service • Provide academic, health, and social services • Wrap social, family, and health services around educational goals	• Deliver coordinated, school-based set of services with community input • Promote community & parent engagement • Engage families as key players, partners	• Use the school as a social center • Provide a broad array of services • Seek to strengthen community infrastructure

Linda Valli, Amanda Stefanski, and Reuben Jacobson, "Typologizing School—Community Partnerships: A Framework for Analysis and Action," *Urban Education*, September 8, 2014, http://uex.sagepub.com/content/early/2014/09/06/0042085914549366.full.pdf.

33 "What is a Community School?" Coalition for Community Schools, http://www.communityschools.org/aboutschools/what_is_a_community_school.aspx (accessed August 26, 2014).

34 John Gilligan: In Memorium," Coalition for Community Schools, http://www.communityschools.org/john_gilligan_in_memoriam (accessed April 27, 2015).

35 "What is a Community Learning Center (CLC)?" Cincinnati Public Schools, http://www.cincinnaticlc.org/about-us/what-is-a-clc (accessed August 26, 2014). "Community Schools Initiatives: Cincinnati Community Learning Centers," http://www.communityschools.org/assets/1/AssetManager/Cincinnati%20Community%20Learning%20FINAL.pdf. The stated goals of the CLC are "to support student achievement, revitalize neighborhoods and maximize the community's return on their financial investments. CLCs act as hubs for community services, providing access for students, families and community to health, safety and social services, as well as recreational, educational and cultural opportunities."

36 Operating in more than 2,200 schools in 26 states and Washington, D.C., CIS is one of the largest providers of integrated student supports that partners with schools. Its mission is "to surround students with a community of support, empowering them to stay in school and achieve in life." For more see Kristin Anderson Moore and Carol Emig, "Integrated Student Supports: A Summary of the Evidence Base for Policymakers," Child Trends, February 2014, http://www.childtrends.org/wp-content/uploads/2014/02/2014-05ISSWhitePaper3.pdf.

37 "Our Story," Communities In Schools, http://www.communitiesinschools.org/about/ (accessed August 26, 2014).

38 Hernández, *New York Times*. See also "2013–2014 Report Card for Cincinnati City School District, Achievement Indicators Met," Ohio School Report Cards, http://reportcard.education.ohio.gov/Pages/District-Report.aspx?DistrictIRN=043752 (accessed April 9, 2015).

39 Interview with Heather Clawson, vice president of research, evaluation, and innovation at CIS, February 26, 2015. See also "Communities In Schools National Evaluation: Five Year Executive Summary," ICF International, October 2010, http://www.communitiesinschools.org/about/publications/publication/five-year-national-evaluation-executive-summary (accessed April 27, 2015).

40 Kristin Anderson Moore, "Making the Grade: Assessing the Evidence for Integrated Student Supports," Child Trends, February 2014, http://www.childtrends.org/wp-content/uploads/2014/02/2014-07ISSPaper2.pdf. According to the researcher:

> Schools which implemented the CIS model with lower quality (i.e., they received a score below 70) did not perform any better than their non-CIS peer schools. Of note, both high-quality and low-quality CIS schools often started with academic outcomes that were below those of their comparison schools, however high implementing schools almost invariably caught up to, and often surpassed, their peer schools by the end of three years.

Moore, p. 71.

41 Moore and Emig, p. 1. The researchers define "integrated student supports" as "a school-based approach to promoting students' academic success by developing or securing and coordinating supports that target academic and nonacademic barriers to achievement."

42 In her review of the literature, Moore explains,

> Program improvements were found for the majority of evaluations assessing math achievement (4 out of 6 QED evaluations, though just 1 out of 4 RCT evaluations). Program effects on reading/ELA achievement were mixed: although 3 out of 3 QED evaluations of CCNX had effects on reading report card scores, program effects were less consistent for standardized test scores of ELA and reading (0 out of 3 RCT evaluations of the CIS program and 2 out of 6 QED evaluations of the CCNX and Comer SDP models).

Moore, p. 63.

43 As evidence of these broader trends, see, for example, Robert Pondiscio, "Let's tell the truth: High-stakes tests damage reading

instruction," Thomas Fordham Institute Flypaper, October 15, 2014, http://edexcellence.net/articles/lets-tell-the-truth-high-stakes-tests-damage-reading-instruction (accessed April 27, 2015) and Christopher B. Swanson, "U.S. Graduation Rate Breaks 80 Percent," *Education Week*, June 2, 2014, http://www.edweek.org/ew/articles/2014/06/05/34research.h33.html (accessed April 27, 2015).

44 Caroline Porter, "More Schools Open Their Doors to the Whole Community," *Wall Street Journal*, July 28, 2014, http://www.wsj.com/articles/more-schools-open-their-doors-to-the-whole-community-1406586751 (accessed April 27, 2015).

45 Interview with Marty Blank, *director of the Coalition for Community Schools*, February 18, 2015. According to Blank:

> Community schools do include coordinated services, but family and community engagement and better learning are also part of our formula. Families are a critical asset in supporting student learning and educators need to work with community partners to enable families to become partners in their children's education. The community also is an untapped resource for deeper learning. The common core opens up possibilities for teachers to work with community groups on challenging environmental and civic issues, to place students in internships in higher education institutions and business, and to create stronger business partnership to enable young people to focus on specific careers while also preparing them for college. Uniting school family and community for student success is the way forward to educating our increasingly diverse student population.

Marty Blank, email to the author, April 2, 2015.

46 According to Daniel Cardinali, president of CIS, "[t]he key is to put dedicated social-service specialists in every low-performing, high-poverty school, whether they are employed by the school district or another organization." Daniel J. Cardinali, "How to get kids to class," *New York Times*, August 25, 2014, http://www.nytimes.com/2014/08/26/opinion/to-keep-poor-kids-in-school-provide-social-services.html (accessed April 27, 2015). The theory, however, suggests that agnosticism around *who* employs this coordinator may be unwise. In some cases, who employs the integrator may matter quite a bit—or, at the very least, the relationships that that integrator can broker may be of great importance. Integration, as we describe it here, cannot simply occur at an arm's length to coordinate logistics or "hand off" students to different providers.

47 Interview with Daniel Cardinali, February 13, 2015.

48 To understand why the processes and priorities of an organization become so rigid and difficult to change—by design—see Clayton M. Christensen, Michael B. Horn, Louis Caldera, and Louis Soares, "Disrupting College: How Disruptive Innovation Can Deliver Quality and Affordability to Postsecondary Education," Center for American Progress, February 2011, p. 32, https://cdn.americanprogress.org/wp-content/uploads/issues/2011/02/pdf/disrupting_college.pdf and Michelle R. Weise and Clayton M. Christensen, "Hire Education: Mastery, Modularization, and the Workforce Revolution," Clayton Christensen Institute, July 2014, http://www.christenseninstitute.org/wp-content/uploads/2014/07/Hire-Education.pdf. To see how this plays itself out in K–12 schools, see Julia Freeland, "From policy to practice: How competency-based education is evolving in New Hampshire," Clayton Christensen Institute, May 2014, http://www.christenseninstitute.org/wp-content/uploads/2014/05/From-policy-to-practice.pdf.

49 In *The Innovator's Solution*, Christensen and Raynor explain:

> Lessons from other industries illustrate how important true integration—as opposed to mere partnerships, no matter how strong—is in certain circumstances. Partnerships or seemingly complementary businesses may at times integrate well together, but at other times may fall short of the true integration. For example, the fate of many of the telecommunications industry's competitive local exchange carriers (CLECs) suggests that not all integrations are seamless. CLECs were part of the federal government's 1996 reforms to spur competition in local telecommunications markets. By unbundling local telephone companies' services, the government aimed to create a market of CLECs

> that could license individual pieces of the local telecommunications networks. The vast majority of CLECs failed, however. One reason for the failure is that there were too many subtle and unpredictable interdependencies between what the CLECs did when they installed service on a customer's premises and what the telephone companies had to do in response. The telecommunications industry, in other words, was not ready for this more modular, "partnership" model that the federal regulations contemplated.

Christensen and Raynor, p. 138.

50 "Rheedlen Centers for Children and Families," Rheedlen Centers for Children and Families, http://wac.adef.edgecastcdn.net/80ADEF/hcz.org/wp-content/uploads/2014/04/Rheedlen-business-plan_FY-2001-2009.pdf.

51 "Harlem Children's Zone (HCZ): Transforming the organization while scaling up in a tightly defined local service area," The Bridgespan Group, October 2004, http://www.bridgespan.org/getattachment/3a789bf1-946d-4534-8334-e1ff29ae855a/Harlem-Children-s-Zone-%28HCZ%29-Transforming-the.aspx (accessed April 27, 2015).

52 Jennifer Steele, "Editor's Review: Whatever It Takes: Geoffrey Canada's Quest to Change Harlem and America," *Harvard Educational Review,* Fall 2009, http://hepg.org/her-home/issues/harvard-educational-review-volume-79-issue-3/herarticle/_744 (accessed April 27, 2015).

53 For a complete list of all of HCZ's offerings, see Danielle Hanson, "Assessing Harlem Children's Zone," The Heritage Foundation, March 6, 2013, http://www.heritage.org/research/reports/2013/03/assessing-the-harlem-childrens-zone (accessed April 27, 2015).

54 Interview with Will Dobbie, Harvard researcher, April 1, 2015. Dobbie clarified that in his upcoming follow-up study with Roland Fryer, they confirm (using sign-in sheets) that the proximity of children's home addresses to the Zone is indeed highly correlated with taking advantage of programs and services.

55 In their article, Dobbie and Fryer explain:

> ...siblings of Promise Academy students also have access to programs that are only provided to Promise Academy students and their families. This includes the provision of nutritious fruits and vegetables, pre-made meals, money and travel allowances to ensure kids get to school, and general advice on how to support their child's learning. If these programs are important for achievement, the siblings of the charter-school students (who did not enroll in the Promise Academy themselves) will benefit. ... [T]he effect on a sibling of a lottery applicant enrolling at Promise Academy appears to be relatively small on test scores, though large standard errors make sharper conclusions impossible. Siblings of enrolled lottery winners gain approximately 0.051 (0.119) standard deviations in math and 0.087 (0.113) standard deviations in ELA for each year a student is enrolled at the Promise Academy. Taken at face value, this suggests that there is likely little to no effect on achievement test scores from the combination of the community and student-family programs.

Will Dobbie and Roland G. Fryer, "Are High-Quality Schools Enough to Increase Achievement Among the Poor? Evidence from the Harlem Children's Zone," *American Economic Journal: Applied Economics,* Vol. 3, No. 3, 2011, pp. 158–87.

56 Dobbie and Fryer, pp. 158–87.

57 Dobbie and Fryer, pp. 158–87.

58 Dobbie and Fryer, pp. 158–87.

59 It bears noting here that the logic of integrating tightly around a particular job also holds for other desirable outcomes, including health outcomes. For example, as institutions of higher education attempt to deliver effective mental health supports to students, those efforts may not be integrated properly in a manner to maximize health outcomes. See, for example, Elizabeth Dobbins, "Working Group Prioritizes Mental Health," The Oberlin Review, February 27, 2015, http://oberlinreview.org/7515/news/working-group-prioritzes-mental-health/ (accessed May 1, 2015).

60 Interview with Dobbie, April 1, 2015. It is worth noting that Dobbie and Fryer's follow-up studies continue to confirm evidence that school-based interventions—not community programs—bore out in other nonacademic

metrics, including decreases in incarceration and teen pregnancy rates.

61 Barack Obama, Remarks in Washington, D.C.: "Changing the Odds for Urban America," The American Presidency Project, July 18, 2007, http://www.presidency.ucsb.edu/ws/?pid=77007 (accessed April 27, 2015).

62 John Gabrieli, "The Promise of Harlem Children's Zone," *Harvard Political Review,* June 11, 2014, http://harvardpolitics.com/united-states/promise-harlem-children-zone/ (accessed April 27, 2015).

63 Kristin Anderson Moore, David Murphey, Carol Emig, Kathleen Hamilton, Alena Hadley, and Katie Sidorowicz, "Results and Indicators for Children: An Analysis to Inform Discussions About Promise Neighborhoods," Child Trends, November 6, 2009, http://wac.adef.edgecastcdn.net/80ADEF/hcz.org/wp-content/uploads/2014/04/Results-and-Indicators-for-Children.pdf.

64 Whitman, p. 207.

65 Whitman, p. 209.

66 Vilsa Curto and Roland Fryer, "The Potential of Urban Boarding Schools for the Poor: Evidence from SEED," Harvard University, July 16, 2012. http://scholar.harvard.edu/files/fryer/files/seed23.pdf.

67 Curto and Fryer found that each year spent at a SEED school increases achievement by 0.211 standard deviations in reading and 0.229 standard deviations in math. According to Curto and Fryer:

> An emerging literature on "No Excuses" charter schools finds effect sizes closest to our own. Abdulkadiroglu, Angrist, Dynarski, Kane, and Pathak (2011) and Angrist, Dynarski, Kane, Pathak, and Walters (2010) find effect sizes similar to ours, with students enrolled in a set of Boston area "No Excuses" charter middle schools gaining about 0.4σ per year in math and 0.1σ per year in reading. Dobbie and Fryer (2011) report that the impact of attending the Harlem Children's Zone's middle schools is 0.26σ in math and 0.05σ in reading. The key difference is that SEED schools increase reading scores more than the typical "No Excuses" charter.

Curto and Fryer, p. 18.

68 According to the SEED Foundation, 82 percent of SEED graduates are first-generation, college-bound students and 92 percent of graduates have enrolled in college. "Results," The SEED Foundation, http://www.seedfoundation.com/index.php/about-seed/results (accessed May 1, 2015).

Additionally, middle school students at SEED School of Washington, D.C. grow 1.5 reading levels in one academic year, on average. The SEED School of Maryland was ranked as one of the top 10 public schools in Maryland for its math scores in 2013. Christina Brown, marketing manager at the SEED Foundation, email to the author, October 27, 2014.

69 Whitman, pp. 205–206. According to Whitman, the school's website notes that "as a boarding school, it is critical for us to ensure than any student who is a risk to themselves, to others, or to the boarding campus does not remain at school." Additionally, as the network has grown, SEED's average dismissal rate has dropped: the average dismissal rate across both SEED schools from Fall 2009 to Spring 2012 was 4.1 percent.

70 Whitman, p. 193.

71 In 2009, French policymakers opened "boarding schools of excellence," which are publicly subsidized institutions designed to serve relatively high-ability students from poor families, because they were concerned that the poor studying conditions and negative influences to which students were being exposed in their home environment would impair their academic potential. A recent study, however, found that although these boarding schools did drive academic growth for students who were already academically strong to begin with, they did not have any relative effect on students who has started out academically weaker. The researchers concluded: "We … find that effects after two years mostly come from the strongest students at baseline. The boarding school does not seem well-suited to weaker students: even after two years they do not experience any strong increase in their test scores." In our estimation, this suggests that the French boarding schools were not designed to provide properly or sufficiently integrated supports such that they could adjust their model to support the "weaker" students and therefore were unable to transform academic outcomes. Luc Behaghel, Clement de Chaisemartin, and Marc Gurgand, "Ready for boarding? The effects of a boarding school for disadvantaged students," February 28, 2015, http://www2.warwick.ac.uk/fac/soc/economics/

staff/cdechaisemartin/ready_for_boarding.pdf.

72 Rothstein, p. 75.

73 Christensen and Raynor, p. 130.

74 Christina Clark Tuttle, Brian Gill, Philip Gleason, Virginia Knechtel, Ira Nichols-Barrer, and Alexandra Resch, "KIPP Middle Schools: Impacts on Achievement and Other Outcomes," Mathematica Policy Research, February 27, 2013, http://www.mathematica-mpr.com/~/media/publications/PDFs/education/KIPP_middle.pdf.

75 According to Dobbie and Fryer:

> We show that input measures associated with a traditional resource-based model of education—class size, per-pupil expenditure, the fraction of teachers with no teaching certification, and the fraction of teachers with an advanced degree—are not positively correlated with school effectiveness. In stark contrast, an index of five policies suggested by forty years of qualitative research—frequent teacher feedback, data driven instruction, high-dosage tutoring, increased instructional time, and a relentless focus on academic achievement—explains almost half of the variation in school effectiveness. Moreover, we show that these variables remain statistically important after accounting for a host of other explanatory variables, and are predictive in a different sample of schools. ... These results align closely with those reported in Angrist, Pathak, and Walters (2011), who show that charter schools that employ a "No Excuses" model, defined as more selective teacher hiring, extensive teacher feedback, increased instructional time, and a focus on discipline and academic achievement, are more effective at increasing test scores. There is remarkable similarity between our findings and those reported in Angrist, Pathak, and Walters (2011) given two entirely different samples and ways of collecting data.

Will Dobbie and Roland Fryer, "Getting Beneath the Veil of Effective Schools: Evidence from New York City," Harvard University, 2012, http://scholar.harvard.edu/files/fryer/files/dobbie_fryer_revision_final.pdf.

76 In a study on fluid cognitive skills, researchers explain:

> Consistent with other research on school effects, we find that the school a student attends can explain a substantial share of the overall variation in test scores: that single factor explains 34 percent of the variation in math scores and 24 percent of the variation for reading. In contrast, after accounting for prior achievement and demographics, the school attended explains just 2.3 percent of our summary measure of fluid cognitive ability. ... Our results show that each year of attendance at an oversubscribed Boston charter school increases the math test scores of students in our sample by 13 percent of a standard deviation. ... Even as students benefit academically, however, their fluid cognitive skills hardly budge. The estimated effect of charter school attendance for each of our measures is very small in magnitude; none is statistically significant.

Martin R. West, Christopher F. O. Gabrieli, Amy S. Finn, Matthew A. Kraft and John D.E. Gabrieli, "What Effective Schools Do," *Education Next,* Vol. 14, No. 4, Fall 2014, http://educationnext.org/what-effective-schools-do-cognitive-achievement (accessed April 27, 2015).

77 See, for example, Philip Oreopoulos, Robert Brown, Adam Lavecchia, "Pathways to education: An integrated approach to helping at-risk high school students," NBER Working Paper 20430, NBER, August 2014, p. 13, http://www.nber.org/papers/w20430.pdf. The authors note that "[t]he approach used in this paper for estimating average program effects cannot be used for trying to disentangle which program components worked and which did not. The components themselves were designed to work together."

78 Given the confusing array of users in the education system—parents, students, the government itself—an articulation of this sort can be difficult to imagine. Short of this happening, like many of the open questions in education today, starting to decouple highly correlated variables will require those entities that are integrating to deploy more sophisticated forms of assessment and longitudinal research

studies tracking their outcomes. According to West et al.:

> Indeed, perhaps the most important implication that we draw is that educators seeking to innovate should get about the business of developing and rigorously testing the effects of interventions to raise these fluid cognitive skills. Improved abstract-reasoning capacity likely has important benefits in its own right and is highly related to important skills such as reading comprehension. Deficits in students' fluid cognitive skills may also prevent even the most effective schools from raising all of their students' academic performance to the desired level.

West et al.

79 See, for example, Scott Wittkopf, "Segregation of Opportunity: Education Funding, A longitudinal study of Wisconsin education funding," Forward Institute, September 2014, http://www.forwardinstitutewi.org/wp-content/uploads/2014/09/AEF-Funding-Study-FINAL.pdf.

80 For more on blended learning, see Michael B. Horn and Heather Staker, *Blended: Using Disruptive Innovation to Improve Schools* (San Francisco: Jossey-Bass, 2014), ch. 2.

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About the Institute

The Clayton Christensen Institute for Disruptive Innovation is a nonprofit, nonpartisan think tank dedicated to improving the world through disruptive innovation. Founded on the theories of Harvard professor Clayton M. Christensen, the Institute offers a unique framework for understanding many of society's most pressing problems. Its mission is ambitious but clear: work to shape and elevate the conversation surrounding these issues through rigorous research and public outreach. With an initial focus on education and health care, the Institute is redefining the way policymakers, community leaders, and innovators address the problems of our day by distilling and promoting the transformational power of disruptive innovation.

About the authors

Michael B. Horn is co-founder and Executive Director of Education at the Clayton Christensen Institute. Michael co-authored the award-winning book *Disrupting Class* and the Amazon bestseller *Blended.* He holds a BA in history from Yale University and an MBA from Harvard Business School.

Julia Freeland is an education research fellow at the Clayton Christensen Institute, where her research focuses on innovative policies and practices in K–12 education. Prior to joining the Institute, Julia worked at NewSchools Venture Fund. She holds a BA in Comparative Literature and Latin American Studies from Princeton University and a JD from Yale Law School.

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