CONDITIONS FOR STUDENT SUCCESS:

The Cycle of Continuous Instructional Improvement

Joanne Weiss
NewSchools Venture Fund

Working Paper 4

March 14, 2007

Daniel J. Evans UNIVERSITY of WASHINGTON
School of Public Affairs

The School Finance Redesign Project

The School Finance Redesign Project (SFRP) encompasses research, policy analysis, and public engagement activities that examine how K-12 finance can be redesigned to better support student performance. The project addresses the basic question, "How can resources help schools achieve the higher levels of student performance that state and national education standards now demand?"

Check in with us periodically to see what we're learning and how that information may re-shape education finance to make money matter for America's schools. You can find us at www.schoolfinanceredesign.org.

Jacob Adams, Principal Investigator

The SFRP Working Paper Series

The Working Paper Series presents analyses that are complete but have not undergone peer review. The papers are subject to change and should be cited as working papers. Their purpose is to promote discussion and to solicit reactions.

Support from the Bill & Melinda Gates Foundation

Introduction

Standards-based reform has laid the groundwork in many states for a strong academic infrastructure that describes, at each grade level and in each subject, what students should know and be able to do. However, embodying these standards in rigorous academic programs that successfully prepare all students for college, careers and citizenship is an extraordinarily difficult task, and one that few urban school systems do well. Organizing an entire school system around high student achievement requires a thoughtful, systemic approach to teaching and learning in which standards, curriculum, assessment (both formative and summative), professional practices, and professional development are carefully designed and mutually reinforcing. Although much is known about high-performing school systems and their cycle of continuous instructional improvement, the work they do today is far from replicable or scalable, relying on extraordinary leadership and effort well beyond what most educators can give. In this paper, we lay out what we do know about the practices that need to be in place, the solutions and tools that need to be built to make those practices scalable, and the deployment of resources (both financial and human capital) necessary to enable continuous instructional improvement and academic gains for all students.

Why Now? The Ecosystem for Success—Standards, Accountability, and NCLB

In the past forty years, one would be hard-put to find examples of federal education policies that broadly impacted classrooms. Court-ordered desegregation rulings, faddish education trends, and even state-level policies have had more impact on what (and how) teachers taught than almost anything coming out of Washington, D.C. During this time, the federal education law— the Elementary and Secondary Education Act (ESEA), first passed in 1965 and reauthorized periodically in the years since—has certainly affected state education offices, which have had to administer block grant and categorical programs of increasing complexity and magnitude. Its effects have also trickled down to district offices, mostly in the form of reports and regulations with which to comply. But in classrooms, federal laws have been greeted with the same heads-down denial that greets new leadership in many districts: "If we just keep doing what we're doing and wait them out, they'll go away."

This dynamic began to change with the 2001 reauthorization of ESEA, called the No Child Left Behind Act (NCLB). NCLB was passed during a fertile moment of time in which outrage was growing about the educational achievement gap, and when global economic shifts were demanding a more educated workforce than our school systems were delivering. Five short years later, the long arms of NCLB are being felt from top to bottom across K-12 public education.

The NCLB legislation has roots in a bipartisan movement toward standards and accountability that was spearheaded by a number of bellwether states throughout the 1990s and supported at the federal level by the Clinton administration. This movement succeeded in creating a state-by-state framework for teaching and learning, consisting of *standards* that described what a student should know ("content standards") and be able to do ("performance standards"), and *assessments* tied to these standards and used statewide to determine each

student's proficiency level. Most states have had standards in place since the mid-to-late 1990s[1], so there was an educational infrastructure in place upon which to build new legislation. Hence, when NCLB was taken up by Congress early in the millennium, it had a wide coalition of backers who had come together around this issue over the course of a decade.

However, two key provisions of NCLB made it different from earlier federal education laws. First, it changed the Title I funding metrics from a focus on inputs to a focus on outcomes. Second, it disaggregated these metrics by school, by grade level, by subject matter, and by sub-group, making transparent what was happening inside classrooms. When the focus of legal compliance changed from reporting on inputs (e.g., number of students served, number of certified teachers, dollars spent per pupil, programs offered) to reporting on outcomes (e.g., student achievement levels, value added by teachers, cost to achieve proficiency, curricular effectiveness), then outcomes started to matter. And when those outcomes had to be reported separately for different subjects (e.g., mathematics, reading, science) and for different student populations (by race/ethnicity, for English language learners, for special education students, for the economically disadvantaged), then each student started to matter; one group's high performance could no longer be used to mask another group's lows.

Whatever one thinks about NCLB, it and the state-level standards and accountability movements have created momentum around improving outcomes for all students, especially those who have been traditionally underserved—momentum that we can and must harness. The intense pressure on each school to make "adequate yearly progress"—that is, to meet its academic improvement targets under NCLB[2]—requires that virtually every teacher improve the academic performance of virtually every student in the class. For the first time in decades, education policies are having impacts that are felt all the way down to the classroom.

Massive cultural shifts need to happen if we are to remake education as a performance-driven system, and it will create high levels of uncertainty and discomfort across the education landscape as processes are re-engineered and ways of thinking are altered. These changes will deeply impact how schools manage their finances; how teachers and principals are prepared, hired, assigned, developed, evaluated and compensated; and of course, how students are taught. It is with this last aspect that we concern ourselves in this paper.

While there is a lot we don't know about how students learn and therefore how teachers should teach, there are some important things we do know. A new body of research is showing quite persuasively that when teachers use student performance data, on a regular basis, to inform and guide their instruction, their students' results improve (Black and Wiliam 1998; Datnow, Park, and Wohlstetter 2006; EdSource 2006; Marshall 2006; Oberman 2006; Waits et al. 2006; Symonds 2003; Thompson 2003). The cycle of continuous instructional improvement, as it is coming to be called, is fairly simple to explain, but it represents such a departure from the

---

[1] The quality of standards varies greatly from state to state. "Weak standards" states, such as Alaska, Montana and Wyoming, do not offer in their standards enough rigor and/or depth to ensure that their students have the skills they need to succeed upon graduation. "Strong standards" states like California, Massachusetts and Indiana provide high-quality models for academic expectation setting (Finn, Petrilli, and Julian 2006).

[2] These new policies are made even more complex by the fact that each state defines its own standards, develops its own test of its standards, and sets its own benchmarks for adequate yearly progress. Aligning each state's accountability system with the federal requirements of NCLB is an often difficult task that is not always done with care and expertise, resulting in sometimes misaligned accountability metrics and systems riddled with gaps and disconnects. All of this makes the jobs of educators in those states that much more difficult.

training and preparation teachers receive in school, and there are so few effective tools and systems to support it, that it is quite challenging to implement effectively.

The Cycle of Continuous Instructional Improvement—What It Is and Why It Matters

The term "cycle of continuous instructional improvement" describes the process by which teachers adapt instruction to meet the differing needs of their students, and by learning from experience and evidence, also improve their own practice.[3] Great teachers have always done this, instinctively taking responsibility for the learning of each of their students and constantly following up to see how each is doing.

As Datnow, Park, and Wohlstetter (2006) describe it, "The endeavor to continuously improve instruction requires school systems to engage in a cycle whereby performance data are constantly gathered, shared, analyzed, and used to inform what is taught and how it is taught. Data are used to inform decisions at all levels and to ensure that system goals are accomplished through alignment of resources and effort" (18). At the heart of this system is data. These data are emphatically *not* the mountains of useless data every school system has today that are stuffed into binders, pouring out of filing cabinets, and cluttering up computer hard drives—methods that render much of it inaccessible, unusable and out of date. The data we require are useful, relevant, accurate, and timely, and can be trusted as the basis for making instructional decisions.

A body of knowledge is coalescing around these practices of continuous instructional improvement, and it is these practices that must find their way into districts, schools and classrooms if we are to enable a successful response to the urgent need to improve instruction. Using this approach, teachers harness research practices to understand, for their small group of students, what works and what does not; they make corrections and test for understanding again. In the absence of scientific trials to validate what instructional strategies work for which students under what conditions (a thorny problem we leave to better minds), the continuous instructional improvement approach offers the most hopeful path to success.

Figure 1 describes the cycle of continuous instructional improvement. While simple in concept, the cycle is complex to implement because in order to do it well, high-quality information must exist, it must be accessible when needed, professionals must know what to do with the information, and they must do it. This cycle turns teachers into researchers and innovators—people who try things, quickly assess if they are working, make corrections as needed, and assess again. The cycle is pedagogically agnostic, deriving from a belief that there is no one way to teach all students. It relies, instead, on multiple strategies for teaching and multiple methods for assessing learning—and assumes that these decisions are today best left to educators who know their students.

---

[3] This definition is provided by the Center for Continuous Instructional Improvement, part of the Consortium for Policy Research in Education at the University of Pennsylvania's Graduate School of Education.
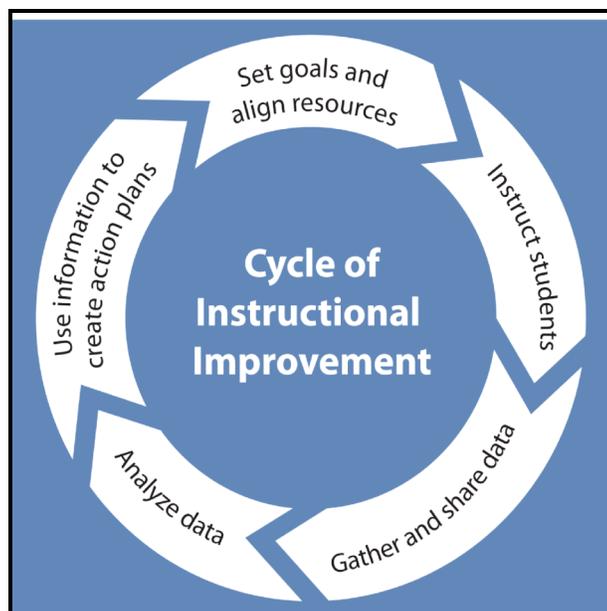
Figure 1. Cycle of Continuous Instructional Improvement

To create the conditions for successful implementation of continuous instructional improvement, school systems must put into place a number of structures, tools and practices, many of which are described below.

Set Goals and Align Resources

This is the planning and preparation phase, the stage during which a coherent *system of instruction* must be articulated, designed and developed. During this phase, the school system must specify, for each grade level and content area, what standards will be taught, when each standard should be mastered, and what instructional materials are available for teachers to use. It is also the time for creating high-quality benchmark assessments that teachers can use to determine what standards their students have and have not mastered, and that principals can use to determine which teachers and students need what types of support. Finally, it is the time for school systems to think deeply about how their talent pool of teachers, principals, coaches and others should be deployed to maximum effect.

Here is an example of one goal articulated by a school district in California:

All students will progress through the bands on the California Standards Test annually (e.g., if a student is "far below basic" one year, he will be at "basic" within a year); thus, within five years of being in the district, every student will be at least at the "proficient" level.

Source Datnow, Park, and Wohlstetter (2006, 21)

In an "ideal" school system, the following activities will all occur before the start of the school year:

- Goals and learning expectations will be defined for the school system, for each school, for each classroom, and for each student. (Note: These goals should be real and grounded in data, so student-level goals will not be set until there is early

6

diagnostic data available, and teachers have had a chance to analyze and "own" it.)

- A curriculum roadmap will be developed that is aligned to the standards, sequenced appropriately, and carefully paced.

- An instructional calendar will be set for the year that correlates to the pacing guide and includes benchmark assessment administrations, professional development time for teachers/principals to collaborate on assessment analysis and action planning, re-teaching time, and so on.

- Benchmark assessments will be developed that are aligned with the standards and that match the sequencing and pacing charts.

- Talent—teachers, principals, and other instructional leaders—will be deployed appropriately so that the neediest schools get the most experienced talent.

Instruct Students

This is where the bulk of classroom time is spent. It is also where the cycle of instructional improvement has very little to say. The cycle focuses on *what* a high-performing system looks like, but allows variation and flexibility in *how* to get there. One school might use direct instruction; another might take a constructivist approach toward teaching and learning; while a third might engage students in project-based learning. Regardless of the pedagogic philosophy of a school (and there should be a coherent philosophy), schools must be able to assess what their students learned, and make appropriate mid-course corrections when students are not learning.

> *As one school district leader put it, "We are in the business of making improvements and making sure that all kids succeed and reach their potential. So, as a result, we need to know what things work and what things don't work."*
>
> Source: Datnow, Park, and Wohlstetter (2006, 29)

The goal, of course, is to teach the content "right" the first time, so that as few students as possible fail to master it; but what works for one student may not work for another. The most successful teachers will have multiple instructional strategies in their quivers, will draw on a range of interventions depending on student needs, and will effectively use "dipstick" assessments (informal questions integrated into a lesson) to gauge student understanding in the moment, and use this feedback to guide their instructional delivery (Leahy et al. 2005).

There is a delicate balance that schools must strike between allowing teachers freedom to make tactical adjustments, based on data, as they deliver curriculum to specific students, and ensuring that these day-to-day, class-by-class decisions are still integrated into a coherent, school-wide pedagogic strategy. This clarity of pedagogic approach at the school-level and proficiency in instructional delivery at the teacher-level are rare, and our professional development and teacher support systems must focus on building and growing these key competencies.

Gather and Share Data

The highest-performing systems use all types of data to inform their understanding of student performance. They look at essays and research papers, presentations and exhibitions, homework and worksheets. They use in-class quizzes and system-wide benchmark assessments. All contribute to their pictures of what students know and can do.

Of these different forms of information, benchmark assessments appear to be among the most powerful instructional levers (Marshall 2006). Benchmark assessments are standards-based tests given system-wide at approximately the same times during the year, and because of this consistency in administration, they allow comparison and collaboration across classrooms and schools. When high-quality benchmark assessments are implemented effectively, they have five significant uses:

- They inform teachers—while there is still ample instructional time available— which students are on track to learning the material that was covered; which students need additional instruction (or full-scale interventions) in order to master key standards; and which standards need to be re-taught to whole groups of students because the initial teaching approach was not effective.

- They enable deep collaboration among same-grade or same-subject teams of teachers around instructional improvement.

- They inform principals about which teachers are struggling and need immediate support.

- They inform principals and school systems about what their general professional development needs are, based on school-wide or system-wide instructional weaknesses.

> *As the superintendent of one high-performing district explained, the district frames data as a support tool for teachers. "Just like for doctors, lab reports are not a bad thing." Test results help teachers diagnose problems, take appropriate corrective actions, and pinpoint when to ask for expert consultation and support.*
>
> Source: Datnow, Park, and Wohlstetter (2006, 21)

- They highlight to school systems the gaps and weaknesses in their curriculum materials.

High-quality benchmark assessments have these critical attributes:

- They are administered at intervals that balance the need to give teachers reasonable "chunks" of instructional time with the need for teachers to have current profiles of student performance. Every five to nine weeks appears about right.

- They are administered before the end of these five-to-nine-week "instructional periods," while there is still time for teachers to use the results to inform their (re)teaching.

- They are expertly developed to accurately and completely reflect and assess the standards the school system is covering. Assessment items could therefore vary

dramatically from one school to another depending on the pedagogical approach and philosophy followed by the school—with one school using multiple-choice items and carefully constructed distracters to assess understanding, for example, while another used portfolio exhibitions to judge learning. In all cases, of course, assessments must, at the very least, address the state's required standards.

- For many students, benchmark assessments provide much-needed test-taking practice—especially if the benchmark assessments mimic the state's standardized tests in item format as well as content.

- It can also help if benchmark assessments not only focus on the standards covered during the current instructional period, but also sample from standards covered earlier in the school year, as a way to provide a lens into students' learning decay rates and trigger review when needed.

- Finally, these assessments affirm student progress and form a foundation for celebrating success.

Analyze Data

Of course, such benchmark assessments—even those that are of high quality—carry little benefit if the results are inaccurate, if they are delivered late (or not at all), or if the presentation of the results is not easily understood. They are also of little use if teachers and principals file them away without analyzing the data and learning from the results. The next phase in the cycle of instructional improvement, therefore, centers around analyzing data and turning it into actionable information.

The best assessment reports will eventually be delivered using technology tools because truly exceptional analytic quality is beyond the scope of manual analysis, and such reports will not assume that teachers are statisticians, expert at the art of data interpretation. The display will be the analysis; that is, the visualization of the data will be so clear and compelling that little analysis will be required and the instructional actions to be taken will be evident (A. Bryk, pers. comm. 2006).

Current research suggests that interpreting student and class data is best done in collaborative groups made up of some combination of teachers, principals, and coaches. Such collaboration has several advantages:

The need for diverse forms of rich data must be carefully balanced against the need not to overwhelm teachers with too much information. Teachers in various school systems remarked that, given their access to a diverse array of data, they did not always know how to decide which data were most or least significant. Most high-performing school systems today are all grappling with using data appropriately, effectively, and efficiently.

Source: Datnow, Park, and Wohlstetter (2006)

- The practices of data analysis are so new to most teachers that working in data teams is a useful way to extend the reach of expert coaches across the widest applicable group of teachers.

- When student work is being analyzed, it is critical to ensure that rubrics are consistently applied and that all teachers have similar (and high) expectations for

the quality of student work. Groups must work together until consistent norms are established.

- Data analysis is a creative task; there is rarely one "correct" answer. As with many ideation activities, the outcomes of a group conversation are typically superior to the results an individual might come up with on his or her own.

- In education settings, in particular, discussing data helps break down the walls between classrooms and teachers, exposing who is truly expert at teaching certain topics and thus making clear to whom one should turn for advice or modeling.

- Finally, at the most basic level, scheduled collaboration ensures that time is actually set aside to engage in analysis.

From these data discussions, action plans for classrooms can be developed as teachers answer questions such as: Which students mastered the key standards and which ones did not? How should I group my students for re-teaching and enrichment activities? What new instructional strategies should I use for students who didn't understand concepts the first time? Which teachers taught this well, and how did they do it? How could our time and resources be re-organized, across classrooms, to maximize student learning?

Use Information to Create Action Plans

Finally, action plans must be developed and implemented. Most high-performing systems employ formal action planning protocols—plans teachers use to document what their data analysis showed, how they intend to group students based on this analysis, and what instruction each group will receive. Such plans are vetted with principals, coaches and other teachers on the team, and time is set aside to accommodate the re-teaching need. Teachers might, for example, have one group do enrichment activities while another gets additional practice and a third is assigned to tutor individual students who need extra help. The teacher down the hall might teach a lesson to an adjoining class if her results demonstrate that she has more effective instructional techniques. Three teachers might dynamically group their students across classrooms by need, and each take a standard to re-teach. And another teacher might run after-school or lunchtime tutoring sessions to provide one-on-one help to struggling learners.

As one superintendent put it, "Once teachers can admit that children are not the problem, instructional strategies are, then learning is going to happen for every child."

Source: Datnow, Park, and Wohlstetter (2006, 26)

All of this requires teachers to have both the time in their schedules to provide additional instruction to students in-need, and the capacity to teach and re-teach using varieties of instructional strategies. Team-teaching, before- and after-school classes, and other innovative approaches must all be on the table. And finally, teachers and principals must be able to enlist students and their parents or guardians in students' educational improvement, making sure everyone in students' lives knows what is expected of them and is committed to helping their children meet their academic goals.

Putting It All Together

What might a performance-driven classroom look and feel like for a typical fifth grade teacher? For six weeks, she teaches the standards identified in her school system's pacing guide. In the weeks preceding this period, she and the other fifth grade teachers worked together to develop unit plans for this content, and they divvied up the lesson planning and shared that as well. During the six weeks of instruction, as she teaches, her students periodically stop her by holding up their red cards to tell her "slow down – we're lost." Or they wave green cards to let her know, "we get it." She integrates all types of questions into her lessons and homework to hone in on what her students understand and what instructional nuances they have missed. At the six-week mark, she gives them the system-wide benchmark assessment. That afternoon, she grades any free-response items that were on the test (such as short answer or essay questions), scans in all of the answer sheets, and immediately prints out her class's progress reports. She starts doing the analysis, guided by the action planning sheet she fills in. Sitting down the next day with her colleagues and their coach to look at the data, she pulls out her hair about the items her students missed, gets ideas from a colleague about how to teach a difficult skill—and shares an idea with him. That afternoon, she follows up by re-teaching two things her class was weak on, tutoring a targeted group of kids at recess, and tailoring her in-class "do now's" and homework to provide additional practice where needed. After three days of enrichment for the proficient students and re-teaching for those who needed it, she's ready to move on to the next unit.

We all know that real classrooms are a lot messier than this scenario paints them, but there is no rocket science involved here. There is, however, an abiding belief that every student can and must learn, and a determination to do what it takes to get every child there.

Creating a Coherent Academic System and Supportive Culture

The cycle of continuous instructional improvement, when implemented well, is a thoughtfully constructed academic system whose components interlock smoothly. However, what we typically see when we look at data-driven decision-making in schools is a fractured and fragmented set of practices. We see benchmark assessments given that do not align to what the teacher is covering, and so yield useless data and waste valuable instructional time. We see 700-page textbooks used as the curriculum and rushed through, page-by-page, by teachers who assume that this textbook (usually the superset of all states' standards) represents the scope and sequence they are responsible for covering in a year. We see teachers who spend so much time on their favorite curricular topics that they leave no time for other core content, so send children to the next grade woefully under-prepared. We must think about how the pieces fit together as a system, because when we do not approach instruction systemically, gaps result that our students fall through.

In addition to the need for systemic thinking, there is a significant cultural shift that must be made as well. There is a pervasive mindset that demands that "we get the testing over with" because testing is antithetical to, and gets in the way of, "real learning." In fact, systematic planning, doing, and reflecting based on data support real learning and re-professionalize teaching. Testing is an important part of the instructional cycle and has a clear place within it, not outside of it. Working to replace more teacher-centered notions of classrooms with student-centered, evidence-based implementation models is hard but critical work. As we begin to

implement effective cycles of instructional improvement, and teachers begin to see real student achievement gains in their classrooms, we will have the makings of a strong foundation upon which to shift the culture.

The Unmet Needs—Why the "Cycle" Cannot Easily be Implemented Today

School systems implementing the cycle of continuous instructional improvement are doing so by brute force today. They hire teams of teachers over summer vacations to write benchmark assessments—rife with good intentions, these untrained professionals often turn out tests riddled with quality problems. Districts employ statisticians at the central office who produce spreadsheets filled with data analysis, much of it centered on the prior year's standardized test results and thus instantly out-of-date. Self-appointed champions at schools spend hours and hours working with colleagues to help them make sense of their data—and in doing so, risk burn-out themselves. And local technologists cobble together software at a school district's behest to meet a set of specific and urgent needs, often producing code that cannot easily be enhanced, generalized, or scaled.

Until recently, we did not have a clear vision of the instructional improvement cycle, so we could not build the right tools. Now we have the vision, but the dearth of tools remains. We need tools that will allow teachers and school leaders to implement the cycle of instructional improvement in robust, supportable, and sustainable ways. We must fund the purchase and implementation of these tools in our districts, schools and classrooms. And we will need to develop the human capital capacity to lead change management efforts, conduct professional development activities, and revamp teacher and administrator credentialing programs such that newcomers enter school systems prepared for this new type of work.

New Tools—What's Needed and Why They Don't Exist

In order to implement the instructional improvement cycle at scale, we need high-quality, robust technology solutions that support a wide swath of critical processes within schools: curriculum-to-standards mapping and sequencing, test item banking, benchmark assessment delivery, data reporting and analysis, knowledge management for sharing of effective practices, and action planning. All of these tasks could be done most easily and effectively with technology mediation or assistance, but few high-quality tools exist today.

None of these tools requires a technology breakthrough; all are feasible to build today. So why don't such tools exist? Although the most likely creators of these tools will be for-profit technology companies, thus far the private capital markets are not jumping in to fund these needs for a variety of reasons.

First, there are quality concerns to address. Most large education companies—such as publishers—make their products conform, for understandable bottom-line reasons, to the superset of cross-state needs. This works (barely, as we have seen) in the textbook side of the business. However, in the testing arena, this business requirement has led to a raft of low-quality formative assessment items that are not targeted properly at the needs of individual states and districts. So, for example, items are created against a set of national standards and are not

customized to address the standards of a specific state. Or items are designed to match the textbook, but only to approximate the state's standards. For standards-based instruction to work, the standards must be at the center of the system; curriculum must correlate to the standards and test items must (independently) correlate to the standards. If curriculum loosely correlates to standards, and test items correlate to curriculum materials, the translation problem will quickly render the assessment data useless for formative purposes. To further aggravate the problem, the tests designed against one set of standards are often presented to teachers in their own state's standards "language," masking and further muddying the question of what was really assessed. If formative assessments aren't testing the right standards and reporting the results in the right ways, teachers will be making important instructional decisions using faulty information, and student achievement will suffer.

Second, school systems are notoriously poor purchasers who generally don't understand their needs well, have protracted and expensive sales cycles, rely too much on personal vendor relationships, and use under-informed cross-functional committees to make key buying decisions. As a result, weak products are often adopted, allowing good ones no opportunity to rise to the top as they would in other industries. In this particular sector, the results are predictable. Because many developers of instructional management systems have no clear vision of instructional improvement, they develop their software based a checklist of the features and functions they believe schools want. Those defining the feature sets on behalf of their schools have no clear vision of classroom needs either, although they do understand their state and federal compliance/reporting needs. The result is a raft of software systems that have been developed, not to address the instructional improvement needs of teachers and principals, but rather to address state and federal accountability requirements. The compliance features trump the instructional features, and when the software is rolled out to classrooms, it becomes clear (too late) that the product makes teachers' lives harder instead of easier. Teachers do not use the system; and if no data goes in, clearly no useful instructional information comes out.

Finally, the venture capitalists who, in other industries, are responsible for providing the funds that seed innovation and enable early-stage startup organizations to address a new market need, have largely turned away from investments in education (see Figure 2). The venture capitalist community learned, when they invested heavily in education throughout the 1990s, that there are not large returns to be made on investments in education, and virtually to a firm, they have ceased investing in early-stage education startups (although limited capital has been invested in some later-stage companies in the past two years). Without startup capital, innovation simply cannot happen.

Seed funding must be provided in order for these desperately needed tools to be created. Thus, it falls to the nonprofit capital markets—including government and foundations—to intervene if we are to properly address this need. It is critical for these groups to step in to ensure that the right solutions are built—solutions that will enable school systems to implement the cycle of continuous instructional improvement with reliability and make the adoption process easier, not harder.
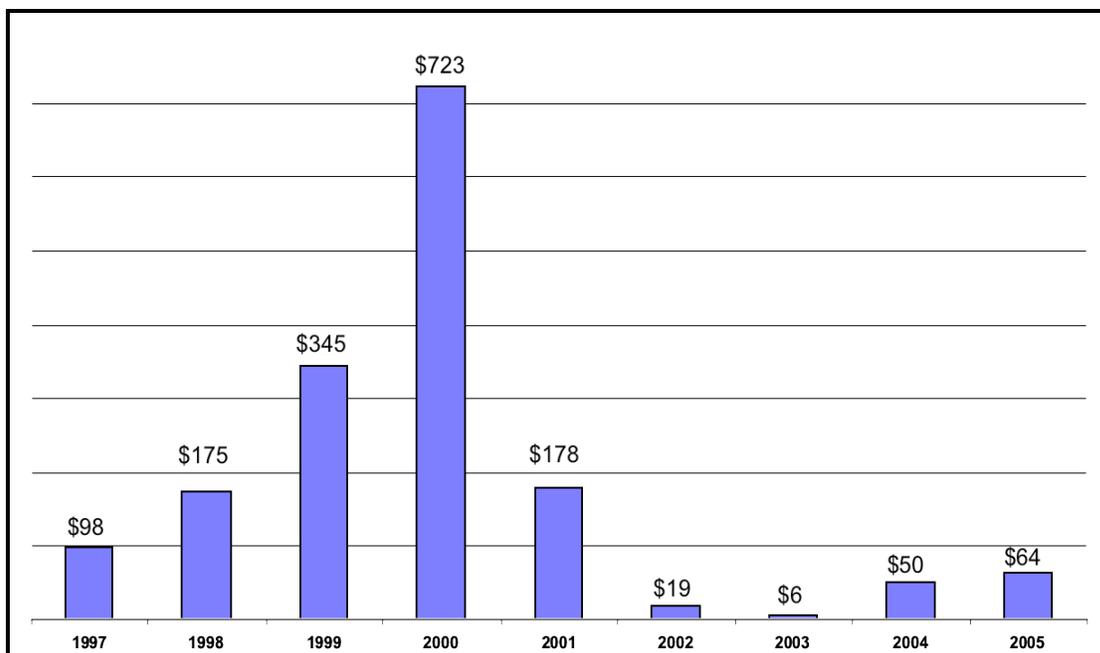
Source: Eduventures

Figure 2. Venture Capital Investments in Companies Creating Products and Services for K-12 Education – All Stages (in Millions)

Implementing the Instructional Improvement Cycle

Once the tools are built, we need the funds to equip school systems, schools and classrooms with these solutions. But even more critical, we need the professional development capacity—the trained, knowledgeable resources in our schools and districts—to help districts manage the change process and implement a new set of data-driven instructional practices.

The cycle of instructional improvement both depends upon and helps construct a very different way for teachers to think about their craft. It turns a process that is internal and instinctive for the best teachers—"what worked today and what didn't?"—and makes it external, explicit, and empirically grounded for all teachers' use. This has implications for the pre-service preparation of teachers, for school culture and change management on-site, and for ongoing professional development. All of these elements must be built into the new core of the school district in order for predictable, continuous instructional improvement to begin to occur.

However, unlike tools creation, which we believe requires investment by external capital markets to nurse it into existence, school-level implementation costs may be folded into the school district's normal operating budget. After all, these activities represent the ongoing, everyday work of schools; they are not special programs to be bolted onto the existing day, they *are* the school day. So, other than startup costs, the implementation of data-driven instructional improvement practices can be woven into the fabric of existing budgets, perhaps even displacing costs that are less effective at addressing student learning.

Conclusion

This vision for the future is not radical; it is happening today in many of the highest-performing charter schools and urban districts in the country, and it is working (Datnow, Park, and Wohlstetter 2006; Oberman 2006; Symonds 2003; Waits et al. 2006). But implementing data-driven instructional improvement demands too much of our educators today. It requires visionary and stable leadership at the district and school levels; it demands the courage and stamina to stay on track and ignore the myriad distractions that arise; and it takes efforts clearly above-and-beyond the levels that are sustainable for teachers and principals. And because continuous instructional improvement is a systemic approach to instruction, it demands concerted, carefully orchestrated activity all across the school system. It is impossible to scale an innovation, no matter how effective, that relies on such superhuman efforts to make it work. The problem, however, becomes more manageable with the assistance of technology; once we have effective technology tools to help us manage, mediate, and make sense of the data, this approach will be scalable and replicable. It still won't be easy. It will still require a new type of teacher and leader preparation, new practices inside school systems, and new support and development infrastructures to accompany it. But it is doable.

Further, the promise and the benefits of wide-scale adoption of data-driven instructional improvement practices go well beyond helping individual students in independent classrooms. If these practices are implemented properly, and technology is used intelligently as a repository for the right kinds of data, the knowledge base in education will grow astronomically. Researchers will have access to information that will provide data-supported insights into the critical questions that hamstring education today. We will learn more about what curriculum materials work best in which settings, under what conditions, for what purposes, and with which profiles of learners. We will have insights into which instructional strategies work in which settings, under what conditions, for what purposes, and with which types of students. We will be able to shed light on the quality of our teacher and leader preparation, credentialing, and professional development programs, and we will have information to guide us as we restructure those programs to maximize their effectiveness.

Today, we are beginning to understand the first necessary steps toward ensuring that all students have access to an educational system that is designed around their success. We must now organize ourselves to deliver it.

References

Black, Paul and Dylan Wiliam. 1998. Inside the Black Box: Raising Standards Through Classroom Assessment. *Phi Delta Kappan*, 80 (2): 139-148.

Datnow, Amanda, Vicki Park and Priscilla Wohlstetter. 2006. *Achieving with Data: How High-Performing School Systems Use Data to Improve Instruction for Elementary Students.*" Los Angeles: Center on Educational Governance, Rossier School of Education, University of Southern California. Available at: http://www.newschools.org/viewpoints/AchievingWithData.pdf

EdSource. 2006. *Similar Students, Different Results: Why Do Some Schools Do Better?* Mountain View, CA: Edsource. Available at: http://www.edsource.org/pdf/simstusumm06.pdf.

Finn, Chester E., Jr., Michael J. Petrilli, and Liam Julian. 2006. *The State of State Standards 2006.* Thomas B. Fordham Foundation. Available at: http://www.edexcellence.net/foundation/publication/publication.cfm?id=358.

Koski, William S. and Hillary Anne Weis. 2004. What Educational Resources Do Students Need to Meet California's Educational Content Standards? A Textual Analysis of California's Educational Content Standards and Their Implications for Basic Educational Conditions and Resources. *Teachers College Record.* 106 (10): 1907-1935.

Leahy, Siobhan, C. Lyon, M. Thompson, and D. Wiliam. 2005. Classroom Assessment—Minute by Minute, Day by Day. *Educational Leadership.* 63 (3): 18-24.

Marshall, Kim. 2006. *Interim Assessments: Keys to Successful Implementation.* New Leaders for New Schools. Available at: www.marshallmemo.com/articles/ Interim%20Assmt%20Report%20Apr.%2012,%2006.pdf.

Oberman, Ida. 2006. *Challenged Schools, Remarkable Results: Three Lessons from California's Highest Achieving High Schools*. Springboard Schools. Available at: http://www.springboardschools.org/research/other_research.html.

Symonds, Kiley Walsh. 2003. *After the Test: How Schools are Using Data to Close the Achievement Gap.* Springboard Schools. Available at: http://www.springboardschools.org/research/other_research.html.

Thompson, Scott. 2003. Creating a High-Performance School System. *Phi Delta Kappan* 84 (7): 488-496.

Waits, Mary Jo, Heather E. Campbell, Rebecca Gau, Ellen Jacobs, Tom Rex, and Robert K. Hess. 2006. *Why Some Schools with Latino Children Beat the Odds…and Others Don't*. Morrison Institute for Public Policy School of Public Affairs, Arizona State University and Center for the Future of Arizona. Available at http://www.asu.edu/copp/morrison/LatinEd.pdf.