Using Early-Warning Data to Improve Graduation Rates: Closing Cracks in the Education System

By Lyndsay Pinkus

With a national high school graduation rate, hovering around 70 percent,[1] far too many of the nation's students are falling through the cracks of the education system and leaving high school without the skills necessary for success in college, work, and life. Anecdotal evidence and national statistics show that educational outcomes for poor and minority children are generally worse than that of their peers. Yet recent research is consistently revealing *academic* factors—known as "early-warning data," "risk factors," or "on-track measures"—that more accurately predict whether or not a student is likely to drop out than *socioeconomic* factors do.[2] This knowledge puts power in the hands of educators to eradicate the "soft bigotry of low expectations" and to strategically focus on the academic factors of success they can positively impact.

Simply identifying at-risk students does nothing to mitigate their risk factors and help them graduate. However, the predictive power of early-warning data is being harnessed by schools, districts, states, and support organizations around the country and being used to guide interventions and embed prevention strategies throughout schools. These approaches, still in their early stages, are helping educators prevent students from falling off the track to graduation and to target interventions and support to students who need them most. Early-warning data also can be used to better understand—and target resources to—low-performing schools where concentrated numbers of students require significantly improved schools in order to succeed.

> The power of early-warning indicators lies in the willingness and capacity of school leaders and educators to transform insightful data into strategic decisionmaking that leads to improved student outcomes.

By preventing students from falling through the cracks and ensuring that they receive the appropriate level of attention, instruction, engagement, and support needed to succeed in their classes, educators can give every student the chance to graduate from high school prepared for college, the modern workforce, and life. This brief explores the predictive power of early-warning data, offers examples[3] of current efforts to use such data to guide secondary school interventions across the country, and discusses the policies that can support these efforts.

Getting to the Roots of the Problem: Early-Warning Data

A glance at high school graduation statistics reveals the following: High school dropouts are more likely to be poor, minority, and male. They are more likely to have had their education interrupted due to challenges such as mobility, homelessness, pregnancy, incarceration, or abuse. This information may de-scribe *who* is dropping out of high school, but it does not explain *why* they are dropping out.

Over the past five decades, research has shown that "*[dropping out of] high school represents a confluence of individual, social, family, cultural, socioeconomic, and institutional factors ... Dropping out*

is best understood as the ultimate end to a gradual process that often begins as early as school entry and through which students lose interest and significance for what schooling offers them."[4]

The decision to drop out is rarely the result of a single life event; in fact, many students exhibit academic warning signs years before they leave high school. Using longitudinal data—information about individual students' progress over time—highly respected researchers from Johns Hopkins University, the Consortium on Chicago School Research (CCSR), and the Parthenon Group, among others, have examined the academic history of dropouts to identify their shared academic characteristics. Students who dropped out usually had received a failing grade in core courses (especially in math or English), earned a low grade point average (GPA), or scored low on achievement tests. They were often retained in grade because they had not earned enough credits to be promoted; as a result, many were older than the other students in their class. Furthermore, as demonstrated by low attendance rates and disciplinary problems, these students were frequently not engaged in their education or aware of its importance to future opportunities.

The early-warning signs of dropping out

When analyzed in combination, these academic characteristics can provide strong indications of which students are at risk of becoming dropouts. Examples from recent research include the following:

- As early as fourth grade, future dropouts from a Fall River, Massachusetts, study received lower grades than future graduates did. The "early dropouts"—those who would eventually drop out of high school between seventh and ninth grade—generally earned a C- academic GPA and ranked in the twenty-fifth percentile of their fourth-grade class.[5]
- Students in Philadelphia who in sixth grade failed either a math or English course, had an attendance rate of under 80 percent, or had a final "unsatisfactory" behavior mark in at least one class had at least a 75 percent chance of dropping out of high school.[6]
- Three out of four students who ultimately dropped out of Philadelphia schools had either a

failing grade in math or English or attendance rates below 80 percent in the eighth grade.[7]

- Seventy-five percent of the dropouts from the Boston Public Schools' Class of 2004 fit into one of four distinct categories: 1) students with multiple ninth-grade course failures; 2) students with one or more eighth-grade risk factors (attendance below 80 percent, two or more years over-age, or failing multiple core courses); 3) late-entrance English language learners; or 4) special education students taught in "substantially separate" classrooms.[8]

- Chicago Public Schools' eventual graduates and dropouts were accurately identified 80 percent of the time using an "on-track" indicator based on the number of credits earned and the number of failures in core courses by the end of the ninth grade.[9] (See graph below.)

Four-Year Graduation Rates by Freshman On-Track Status
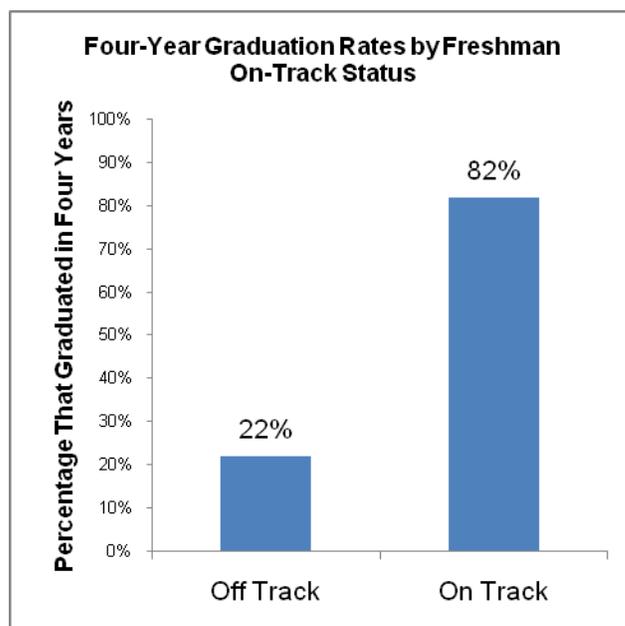
Graduation rates of Chicago Public School freshmen identified by on-track indicator.

Source: E. M. Allensworth and J. Q. Easton, *What Matters for Staying on Track and Graduating in Chicago Public High Schools* (Consortium on Chicago School Research at the University of Chicago, 2007).

The benefits of early-warning data

The ability to pinpoint and the opportunity to address these academic issues is good news for educators, reformers, and advocates interested in improving student outcomes. First, it is no longer

necessary to rely only on the broader socioeconomic markers of demographics and economic status to identify students at risk of dropping out. Instead, specific academic early-warning data and well-designed monitoring systems can be used both to identify at-risk students and to gauge their level and cause of risk. Second, while educators cannot change the out-of-school factors that may contribute to a student's decision to drop out, by focusing on improving students' academic performance they can reduce how much those nonacademic factors interfere with students' eventual educational success. Lastly, patterns in early indicators can be examined at the school and district levels to identify systemic weaknesses in schools that are actually increasing the likelihood that students will drop out.

It may seem intuitive that students with the academic risk factors described in this brief are more likely to drop out, and that educators would use this information to target students for intervention. Even so, formalizing the use of early-warning data can serve as a way to make that information understandable and actionable in a strategic way throughout a school. Some examples of this include:

- shining a light on the exact indicators that are the "tipping point" for student success;
- serving as a mechanism for pulling together disparate data and sharing it with classroom teachers who wouldn't have access to it otherwise;
- helping to prioritize among students along the spectrum of weaker performance;
- acting as an organizing tool for structuring interventions; and
- identifying goals for the interventions.

> A recent analysis of Los Angeles' students' outcomes found that "academic experiences explained six times more of the difference in graduation rates among students…than demographic characteristics."
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> Source: D. Silver, M. Saunders, and E. Zarate, *What Factors Predict High School Graduation in the Los Angeles Unified School District* (California Dropout Research Project at the University of California Linguistic Minority Research Institute, 2008).

Developing Early-Warning Systems

The indicators isolated in the studies described above are examples of "high-yield" indicators: collectively, they identify a significant portion of future dropouts and identify students who—absent intervention—have very low odds of graduating.

Early-warning data offers a way to address a problem that plagues many dropout prevention efforts: efficiently targeting the right students. By using early-warning data to predict future dropouts, educators can reduce the inaccurate targeting—to students who are unlikely to benefit from them—of these kinds of interventions. Specifically, students who might be considered at risk of dropping out due to demographic factors, but who are actually successful in school, would not receive unnecessary dropout prevention interventions, while students with high-yield academic risk factors who would otherwise remain unidentified would be more likely to receive the help they need.[10] Educators, reformers, and policymakers alike may choose to embrace early-warning data systems as tools for the more effective and efficient use of scarce resources to improve student outcomes.

Some indicators are usually strong predictors

For decades, researchers have studied dozens of factors that have an impact on whether a student is more or less at risk of dropping out.[11] However, several indicators continually rise to the top of the predictive list; these indicators were paramount in the various early-warning studies cited above and critical to early-warning systems development in cities across the country. Researchers from the Everyone Graduates Center at Johns Hopkins University are currently working with more than ten school districts to develop early-warning data systems. "In the high-poverty districts we are working in, we have not found one district where grades, credits, and attendance are not highly predictive," noted Robert Balfanz, co-director of the center.[12]

> A large-scale evaluation of federally funded dropout efforts found that "dropout prevention programs often serve students who would not have dropped out, and do not serve students who would have dropped out."
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> Source: P. Gleason and M. Dynarski, "Do We Know Whom to Serve? Issues in Using Risk Factors to Identify Dropouts," *Journal of Education for Students Placed at Risk* 7, no. 1 (2002): 25–41.

- **Course success**

Research demonstrates that course success may be the best predictor of eventual graduation. CCSR's study of the Chicago schools found that students with a B average or better in their freshman year have more than a 95 percent chance of graduating. On the other hand, those freshmen with less than a C average are more likely to drop out than to graduate. In fact, once students' freshman-year grades are known, other background information, including test scores, does not improve the predictability of graduation. Course grades also are the best predictors of improvements on test scores and college graduation.[13]

This supports the commonsense notion that lack of success in academic courses serves as a barrier to graduating from high school. As students fall farther behind in their course work, they lack the number of credits to be promoted to the next grade, are required to repeat classes and grades, and become older than their classroom peers, all of which makes them more likely to drop out. Fortunately, there are many classroom strategies educators can use to increase students' course success, including improving and personalizing instruction, providing extra learning time, striking a balance between relevance and rigor, and providing support for students who are struggling with skills or content.

- **Attendance**

Nowhere is the saying "Showing up is half the battle" more true than in education. Especially for students who are struggling academically or lack academic support at home, the primary way to build the skills and knowledge necessary for success is through participation in classes. Student attendance is more difficult to control, of course, as students get older and have increased autonomy over their schedules and transportation; absenteeism due to reasons other than illness and cutting individual classes increases with each grade, starting in the sixth.[14] Not surprisingly, absenteeism, cutting classes, and truancy all have been found to be highly correlated with dropping out.[15] In a large longitudinal survey, students who had high absenteeism, cut classes at least once a week, *or* were tardy ten or more times in a single month were more than six times as likely as their peers to drop out.[16] Recent research in Chicago found that nearly 90 percent of freshmen who

missed less than a week of school per semester graduated, regardless of their eighth-grade test scores.[17] Dropouts themselves acknowledge the importance of attendance; in a recent survey of those who chose to leave school without attaining a diploma, missing too many days of school and having trouble catching up was the second most reported reason for dropping out.[18]

While research on student engagement and attendance demonstrates the complexity of these issues and their solutions, successful high schools and high school reform models often take a strategic approach that includes both preventive and responsive strategies. One study that surveyed strategies for increasing attendance described them as falling into four overlapping categories: sound and reasonable attendance policies with consequences for missing school; early interventions; targeted interventions for students with chronic attendance problems; and strategies to increase engagement and personalization with students and families that can affect attendance rates.[19]

- **Academic skills**

Literacy is the gateway skill that students must have mastered if they are to be successful in any course; low literacy levels translate into poor grades, grade repetition, and eventual disengagement from school, all of which tend to precede a student's decision to drop out.[20]

In an average high-poverty urban school—where dropping out is sometimes more common than graduating—approximately half of incoming ninth-grade students read at a sixth- or seventh-grade level.[21] This means that they cannot navigate or comprehend textbooks designed for ninth graders and will quickly become lost in their courses. "Kids would rather be bad than be embarrassed. When students are able to acquire the skills needed to succeed, their grades improve, attendance improves, and behavior improves," notes former high school principal Mel Riddile.[22] (See box on page 5 regarding the use of literacy data at his high school in Virginia.) Successful high schools and high school reform models across the country are identifying struggling readers and including adolescent literacy support as part of their game plan.

Using Literacy to Measure Progress

At T. C. Williams High School in Alexandria, Virginia, educators explicitly set college and work readiness at graduation as the goal for all students. As part of a comprehensive school improvement approach that necessitates strong leadership and staff buy-in, the school places a high value on literacy as a predictor of graduation. Former principal Mel Riddile recently noted, "Our literacy rate is the same as our graduation rate, and that is no coincidence." Using the Lexile scale for reading, which matches reader ability to text difficulty, they identified a Lexile score of 1,300 as the proxy for twelfth-grade college and work readiness. Working with the middle schools, a Lexile goal was set for each grade from sixth grade forward. Students are assessed regularly to see if they are on or off track to achieving the literacy skills needed for graduation. Educators then implement strategies to address the three factors that schools can control in supporting at-risk students: time, setting, and method. Struggling readers are enrolled in an additional intensive reading class with a reduced student-to-teacher ratio and are taught by teachers who have received training in literacy instruction methods. Prior to these interventions, only 10 percent of students who did not pass the state reading test on the first try passed on the second try. In just the first year of implementation, the second-try pass rate increased to 55 percent—and it continues to rise.

Source: M. Riddile, personal communication, March 5, 2008.

Approaches to building early-warning data systems

While some indicators almost always have value in predicting dropouts, the yield of each indicator also depends on its "trigger"—that is, how it is applied. For example, at what *number*, at what *percent*, or in *which grade* is the indicator a stimulus for action? Research on attendance rates in Philadelphia provides one example. In identifying factors that gave students at least a 75 percent chance of dropping out,

researchers found that less than 80 percent attendance was the tipping point in eighth grade, while less than 70 percent attendance was the tipping point in ninth grade.[23]

To ensure that the indicators being used have the highest yield possible, educators and administrators using early-warning systems must be prepared to adjust their indicators and triggers as new or better information becomes available. For example, when Chicago Public Schools adopted CCSR's freshman on-track metric as part of a new early-warning intervention program, district officials added easy-to-access indicators (including multiple disciplinary infractions and eligibility for, but nonparticipation in, summer transitional programs) at the suggestion of district staff and program educators.[24] Similarly, at Abbeville (Louisiana) High School, former principal Ralph Thibodeaux constantly reevaluated the triggers in his early-warning data system to make sure he was accurately identifying at-risk students.[25]

Leaders creating early-warning systems must also be aware of their capacity to intervene with the identified students. Staff burden was one of Thibodeaux's constant concerns as he adjusted the early-warning triggers to identify only a manageable number of students. Bobby Franklin, a Louisiana Department of Education official, echoes this point, cautioning against the use of early-warning indicators and triggers that place too many students in the at-risk category. Not only will this reduce the sense of urgency for educators with regard to the at-risk students, but, as he says, "if the list is too long, the educators won't be able (or willing) to carry the burden."[26] As a result, limited resources may inevitably influence decisionmaking around the use of early-warning data.

Two Birds With One Stone: Improving Test Scores and Graduation Rates

A recent analysis by CCSR found that the very factors that keep students on track to graduation—course success, attendance, and behavior—also drive success on test scores. Therefore, by focusing on the quality of course work and instruction and student behaviors, educators can increase both test scores *and* graduation rates. In other words, improving both test scores and graduation rates are manageable and compatible goals for improving low-performing high schools.

Source: E. M. Allensworth, M. Correa, and S. Ponisciak, *From High School to the Future: ACT Preparation—Too Much, Too Late* (Consortium on Chicago School Research at the University of Chicago, 2008).

Because both the pattern of high-yield risk factors and the capacity for intervention vary, schools and districts need to determine the data that is most predictive and actionable for their particular system.[27] There are several approaches to recognizing early-warning indicators and developing the data systems to track them and identify students that exhibit them. While this work can be completed using sophisticated systems that have tracked student data for years, it can also be done with simpler research and tools available at the school level.

- One approach (used in Chicago, Boston, and Philadelphia) is to analyze historical data on past dropouts to identify common academic risk factors.[28] Even without expensive longitudinal studies, simpler analyses can be conducted using past transcript data and school records.[29]

- Even in the absence of historical information, data currently available at the school level can be useful. For example, using graduation requirements and working backward to identify interim benchmarks of success, New Visions for Public Schools in New York City developed a metric to measure whether students are on track to graduation (see box to the right).

- There is also an increasing interest in developing and using indicators that measure a student's preparedness for college; as a result, many efforts are under way to define and track progress toward that goal. Examples include efforts by several states (including Florida, Massachusetts, and Texas); assessment developers (including ACT, the College Board, and the National Assessment Governing Board[a]); organizations (such as New Visions and CCSR); and even individual schools (for instance, T. C. Williams High School in Virginia; see box on page 5).

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[a] The National Assessment Governing Board (NAGB) administers the National Assessment of Education Progress (NAEP) assessment, also known as the Nation's Report Card. NAGB is in the process of redesigning the twelfth-grade NAEP to measure postsecondary preparedness.

New Visions for Public Schools' On-Track Metric

New Visions for Public Schools, an education reform organization in New York City (NYC) that supports more than sixty-three of the city's public schools, has developed an on-track metric for use in its high schools. The metric is based partially on CCSR research and findings from NYC's Department of Education's Office of Multiple Pathways. New Visions uses New York State's graduation requirements (a combination of course credits and pass grades in a series of end-of-course state Regents exams) to map out the progress students need to make each year to graduate with a regular diploma in four years. In addition, the metric includes indicators of college readiness that go beyond the state's high school requirements. Using this metric, each student's status is described through the use of color-coded categories: on track to college readiness (blue); on track to graduation (green); almost on track to graduation (yellow); or off track to graduation (red). New Visions analyzes the data for each school and provides administrators with a schoolwide report on student performance based on the metric. It also creates snapshots that can show an individual student's progress toward graduation and college readiness, and encourages students to create a plan to get (or stay) on track. New Visions' schools also employ a comprehensive data-driven model of instructional and operational improvement and school leadership development known as the Scaffolded Apprenticeship Model (SAM). Each school convenes one or more teams comprised of the principal or assistant principal, teachers, and school counselors who are trained to analyze data and to develop and assess tailored strategies to improve instruction for a group of targeted, low-achieving students. This strategy helps ensure that data use becomes an intrinsic component of the school's daily operations.

The color-coded tools are easy to understand; as a result, schools are using the information in a variety of ways. School leaders and staff are employing schoolwide and individual student data to plan interventions and decide what professional development their teachers need. Student snapshots are shared with students and parents, making it easier to understand the complicated graduation requirements and the steps a student must take in order to get on track. A number of high schools served by New Visions use the on-track metric as a tool for creating individual graduation plans for each student. New Visions' new college-readiness metric, based on college entrance requirements, is helping students and families understand the difference between high school graduation and college readiness. New Visions is now developing a high school-readiness metric for use in its middle schools.

While it is too soon to quantify the effects of these efforts, the New Visions experience thus far illustrates how easy-to-understand information can lead a variety of stakeholders—educators, students, and families—to make data-driven decisions that are likely to positively impact student success and outcomes.

Source: R. Genn and B. Gunton, personal communication, 2008.

Putting the Data to Work: Addressing Students' Academic Challenges

Early-warning indicators provide a helpful way of looking at the academically diverse populations served by America's secondary schools, including:

- *Students who struggled in middle school and entered high school already off track or at risk.* Many incoming ninth graders already lack the necessary academic skills, behavioral habits, and course-taking history that are necessary for success. These students need close monitoring and support that starts in the middle grades and continues through high school. Particular attention must be paid to these students as they move through the notoriously difficult transition from middle to high school, where any existing challenges are often compounded.

- *Students who struggle during ninth grade.* Success in ninth grade is critical to graduation. Some students struggle immediately, failing multiple classes or having high absentee rates in the first term of their ninth-grade year. These students need immediate interventions; if these actions are not successful by the end of the freshman year, it may indicate that the student needs more intense intervention or an alternative pathway that allows for a more individualized approach.[30] Other students may fail one or two classes in their first semester or year of high school, or fail no classes but achieve less than a C average. These students are likely to be positively influenced by modest intervention efforts, such as summer school or peer-support groups.

- *Students who start high school on track but drop out in later years.* For many of these later dropouts, the high school experience itself is what contributes most to their lack of success. The relatively small number of students who start high school on track but whose grades or attendance begin to drop in later years usually experience some crisis while they are in high school and benefit from a short-term intervention to get them back on track.

Using tiered interventions to address student challenges

The power of early-warning indicators lies in the willingness and capacity of school leaders and educators to transform actionable data into strategic decisionmaking that leads to improved student outcomes. But early-warning data and the identification of at-risk students are not silver bullets; rather, they are factors to be included in the complex mix of elements that together can result in comprehensive secondary school improvement.

As school leaders strive to implement comprehensive intervention and improvement strategies that address the needs of all the students in the school, the emerging use of early-warning data has led to the application of tiered intervention models (described in the following pages) to complement those strategies. Such models include applying broadly supported preventive efforts populationwide; continuously identifying at-risk individuals; and providing successive levels of intervention for those who need them. This approach can help all secondary schools meet the differing needs of their academically diverse student populations and should be considered part of the data-driven decisionmaking that is a critical component of secondary school design and reform efforts; the use of early-warning data is one way to do this.

►*Preventive strategies* **to ease transitions and focus on progress toward graduation:** *Preventive strategies* can be used schoolwide to reduce student risk factors and the number of dropouts by providing students with consistent attention to their progress, motivation to succeed, sense of control and accountability for their success, and support at critical junctures. Such strategies—including personalized graduation planning processes, various ninth-grade transition strategies, and strong behavior and attendance policies (described above)—can create a stable learning culture. Research on ninth-grade transition strategies as summarized recently by the Council of the Great City Schools "suggests that strategies that offer personalized attention, supplemental academic instruction, and increased exposure to core courses, can improve the ninth grade transition and students' progress through high school, particularly for high needs students."[31] If prevention strategies are successful, fewer students will demonstrate risk factors and more will progress toward graduation.[32]

►*Group strategies* **to address particular risk factors:** Second-tier interventions are intended to address the group of individuals (commonly 15 to 20 percent) who are not responsive to or protected by the first-tier interventions. *Group strategies* can be directed toward students who share a particular risk factor or struggle with similar challenges. Implementation should ensure that group strategies continue to match the individual students' academic challenges. Targeted interventions can include daily attendance check-ins, behavior checklists brought to each class, or extra-help courses. These strategies can be particularly useful for students who are not yet completely disengaged but show clear signs of risk.

►*Individual strategies* **to reach the most challenged students:** In the third tier, the small percentage (5 to 10 percent) of individuals whose needs are not addressed by the group strategies are supported with individually delivered, intensive interventions. *Individual strategies* can be used to provide intensive attention for students who need one-on-one support to succeed.[33] Such support may include individual counseling or tutoring, behavior contracts, or the involvement of social workers or psychologists to reach these students.[34]

►*Alternative strategies* **to serve students not likely to succeed in their current setting:** A small number of students face unique challenges that are not likely to be solved in the traditional educational settings they have struggled in for years. For example, one subset of this group of students is known as "over-age and under-credited." Academically, these students are two or more years off track from graduation and likely need more individualized instruction than can be offered in most high schools. They are not comfortable socially in classes with much younger students, become increasingly frustrated by their lack of academic success, and feel further isolated in remedial pullout sessions. Many of these students also have additional financial or family responsibilities outside school that make attending a traditional high school difficult. Fortunately, districts across the country are successfully using data to identify over-age and under-credited students. Common alternative settings include comprehensive alternative schools, programs targeted to meet the needs of populations with alternative learning styles or schedules, integrated-services schools (providing

services such as child care, housing, mental health, and so on), and blended academic and career programs.[35]

Success with Multiple Pathways

Following an analysis of their student outcomes that demonstrated that 93 percent of dropouts were over-age and under-credited, the New York City Department of Education created multiple pathways designed specifically for such students. The graduation rate for this population increased from 19 percent in the traditional schools to 56 percent at small, transfer schools and 39 percent in evening programs.

Sources: American Youth Policy Forum, *Forum Brief: Development and Implementation of Multiple Pathways to Graduation in New York City—Friday, October 26, 2007*, http://www.aypf.org/forumbriefs/2007/fb102607.htm (accessed June 4, 2008); J. Lynch, "Using Data to Guide the Development of Multiple Pathways," paper presented at the Symposium on Federal Policy and Persistently Failing Schools, May 14, 2008.


Examples in action

Below are examples of how a school reform model, a school district, and a high school have used early-warning data to implement tiered interventions:

- The researchers behind the Talent Development secondary school reform models, working with the Philadelphia Education Fund and the School District of Philadelphia, have used their findings from early-warning studies to design and pilot a prevention and intervention program in Philadelphia's middle schools. As mentioned earlier, they use four easily and commonly measured factors—poor attendance, poor behavior marks, a failing grade in math, or a failing grade in English—that are highly effective in identifying the majority of sixth graders who fall off the path to graduation. The prevention and intervention plan addresses each factor in three stages (whole school, targeted, and intensive) to attend to the needs of all students within the school, as illustrated in the figure to the right.[36] Whole-school strategies include student advisories, consistent responses beginning with the student's first unexcused absence, and research-based instructional programs. Targeted interventions can include daily attendance check-ins, behavior checklists brought to each class, or extra-help courses. Intensive support can include in-depth behavioral assessments, one-on-one tutoring, and bringing in appropriate social

services. An early-warning indicators section has been added to the school district's data system, enabling classroom teachers in the pilot schools to view continually updated indicator profiles of the students in their classes. Teachers sharing common sets of students meet regularly to monitor student progress, intervene early, and track the success of interventions.[37]
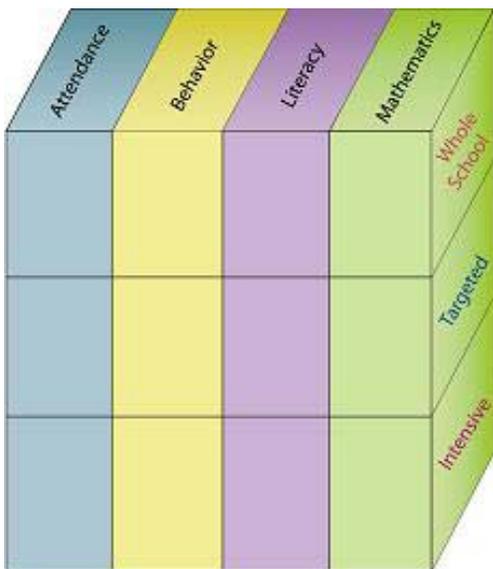
This figure illustrates how schools participating in the Talent Development middle schools pilot organize interventions around the four risk factors.

Source: R. Neild and L. Herzog, "The Secondary Continuum—Keeping 6th–12th Grade Students on Track to Graduation," paper presented to the 4th Annual Middle Grades Matter Conference, May 25, 2007, www.philaedfund.org/mgm/MGM%202007%20Neild%20and%20Herzog.ppt (accessed on March 3, 2008).

- Using data from a districtwide system, Louisiana's Abbeville High School has developed an early-warning system and a five-level intervention system that includes a comprehensive program for all ninth-grade students, known as the "freshman academy." At-risk students are identified every three weeks, using discipline, attendance, overall GPA, and decline in GPA as warning indicators, from data system-generated reports. Educators then provide these students with a variety of progressively intense interventions, including mandatory tutoring, staff and student mentors, and increased levels of communication with families. In its first year of full implementation, the combined use of early-warning systems and the freshman academy decreased the number of ninth graders who were not promoted to tenth grade by 50 percent.[38] At the end of the 2008 school year, a full 90 percent of Abbeville's ninth graders were promoted to tenth grade.[39]

- Chicago Public Schools is piloting an early-warning and intervention system in six of its high schools. Using students' historical data that correlates with the CCSR on-track metric (based on attendance, grades, age, and discipline record), the central office analyzes the student data and provides each school with a list of at-risk students. The school then uses this information and other school-based data (extracurricular activities, parent engagement information, and academic and discipline records) to develop, for each student, an intervention strategy that addresses four issues: parent engagement, connection to the school community, social and emotional support, and academic support.[40]

Using Early-Warning Indicators at the School and District Levels

While early-warning data can certainly be used to identify and intervene at the student level, there is also application for this data at the school and district levels.

First, early-warning data can be used to better understand the nature of the *academic* problems in low-performing secondary schools. Examining the patterns of early-warning indicators can unearth systemic weaknesses and enable schools and districts to address them head on. Early-warning data can help to identify schools that face high concentrations of incoming, off-track students; have large clusters of students with certain academic risk factors; have a history of contributing to risk factors; or are unable to mitigate risk factors. This kind of data can help educators pinpoint and address problems at the school and student levels systemically. For example, a school that sees low student attendance during morning classes can develop schoolwide strategies to get students to school on time. Or a feeder middle school whose students consistently

struggle through the first semester of ninth grade might benefit from partnering with the high school to develop a transition program. This data is useful for those charged with improving school outcomes and for the policymakers interested in targeting resources to the schools that face the most significant academic challenges.

Second, early-warning data can be used to assess the effectiveness of strategies in a timely manner. End-of-the-year test scores or years-away graduation outcomes are an inefficient feedback loop for assessing the impact of educators' strategies and interventions. Early-warning data that is available to school leaders and educators on a more frequent basis—such as attendance, behavior, and course grades—can provide a quick read on these efforts and guide adjustments and targeting of resources.

Early-warning data also provides a way to demonstrate whether an entire school is on track to improving graduation rates. There is emerging consensus that it may take several years for whole-school reform strategies to manifest themselves in the consistent, large increases in graduation rates and test scores[41] that are often used to make accountability judgments and allocate resources. In the meantime, schoolwide early-warning data can provide a way for school leaders to demonstrate interim improvements that research indicates will lead to increased graduation rates.

Lastly, easy-to-understand early-warning data can be a powerful tool for garnering support from key stakeholders for needed interventions. Across the country (see box below), educators and advocates are using this data to engage disenchanted students in shaping their own futures; to involve sometimes elusive high school parents in their children's academic progress; to empower educators with actionable data; and to solicit resources from local partners.

Data Can Empower Stakeholders to Embrace Interventions

Early-warning data is being used in a variety of ways to engage critical stakeholders in actions to improve student outcomes.

A **New York City high school** principal employing New Visions' on-track metric (described in the box on page 6) has posted each student's individual on-track status on a large board in his office. This has generated significant excitement from the students, who are now actively engaged in their on-track status and sometimes update their own status on the board.

At **T. C. Williams High School in Alexandria, Virginia**, students' reading scores are sent home to parents each quarter. With timely and easy-to-understand student performance data, parents are more willing to accept intervention decisions, such as requiring a student to give up an elective course or participate in afterschool sessions in order to receive more literacy instruction. (See box on page 5.)

In summer 2008, **Connected by 25,** a coalition in **Portland, Oregon,** of thirty-five education, business, and community organizations, will launch the Ninth Grade Counts program, which will target 1,500 of Portland's most at-risk students (as identified through the use of early-warning data). Using a concentrated marketing campaign, Connected by 25 has successfully communicated the importance of helping these students—future Portland citizens and workers—graduate from high school ready for work and college. As a result, the local partners are committing time, funding, and staffing resources to improve outcomes for the city's most at-risk students.

Sources: R. Genn, M. Riddile, and T. Somerville, personal communication, 2008.

Policies to Support the Implementation of Early-Warning Systems

There is no question that the real test for using early-warning data exists at the school level, where teachers and other school staff interact directly with students. However, most schools and educators already have too much to do. There might be considerable enthusiasm for putting an early-warning data and intervention program in place, but enthusiasm alone is not enough. Many schools simply do not have the internal capacity—including time, expertise, and technological tools—to analyze student data, select indicators and triggers, identify at-risk students, communicate this information to necessary stakeholders, and train and support school staff to maximize the power of these systems.

Partners and policymakers at all levels can—and must—play valuable roles in the development and use of early-warning data systems to improve student outcomes.

1. Building the infrastructure to predict future dropouts

Implicit in the application of early-warning data systems is the existence of and access to necessary data. Current efforts across the country at the state and district levels have demonstrated that data systems can be expensive to build and maintain over time. By investing in systems that respond to both short- and long-term needs, policymakers can help ensure that educators have the most up-to-date information and tools to make informed decisions.

As states and districts scurry to respond to the call for data-driven decisionmaking and develop data systems to meet their needs, there is increasing concern about the lack of alignment between those systems. This is often because state systems and district systems collect and house very different kinds of information. In the case of early-warning systems, end-of-year statewide test scores—the student performance data most commonly collected at the state level—will not suffice. States interested in analyzing or providing early-warning data need to include real-time early-warning data usually only stored at the local level—such as course attendance, failures and grades, and test scores—in the statewide system. This is not the case in most states; in fact, of all the early-warning data systems identified in the preparation of this brief, only Louisiana's (see box on page 12) demonstrates an alignment between the state and district systems that allows for the sharing of early-warning data.

Developing an early-warning system can require schools to overcome a range of technical issues, such as purchasing or building data systems and working with vendors. There are also numerous considerations related to the data itself, including accessing necessary information from multiple systems and conducting the analyses to identify indicators and set triggers.

By handling some of these issues at the district or state levels, officials can reduce burdens on schools and maximize resources. This support can include purchasing new data systems, streamlining existing ones, or embedding technology that automatically analyzes the data and reports the

information to school leaders. By aggregating data beyond the school, district and state officials can identify high-need schools and districts or even feeder patterns of low-performing middle and elementary schools.

In states with high-quality statewide data systems that serve as a central repository for district information, state education agencies are also well positioned to evaluate and compare intervention programs across the state to ensure that student outcomes are improving, and to identify district- or statewide patterns.

2. Building capacity to implement early-warning and intervention systems

Even when technical and data issues are addressed, educators may need help in using early-warning data to improve student achievement and outcomes. As one Boston educator noted, "Having outside people come into a district and help look at data is crucial."[42] External support organizations that have expertise in data analysis can serve as valuable partners to schools, districts, and states managing and using data to identify at-risk students. In fact, in nearly every example in this brief of a school or district early-warning data system, the school or district has benefited from this type of support from a nonprofit organization, school reform organization, institution of higher education, or private-sector partner.

With or without the support of external partners, finding time to analyze data and collaborate with colleagues can be a challenge for educators. According to nonprofit technical assistance provider Learning Points Associates, "Schools that are committed to using data to guide their work allocate time for teachers to meet, discuss, reflect upon data, and make informed instructional decisions. Schools identify the need for this time, then find it through a combination of creative scheduling ... and priority setting."[43] School and district policies, such as those involving school structure and school improvement planning, must recognize this need.

Educators are more likely to use data when it is communicated clearly and in a way that allows them to translate it directly into action. States, districts, and partner organizations can provide a

valuable service by creating easy-to-use tools for understanding the data, such as New Visions for Public Schools' color-coded metric, Philadelphia Education Funds' early-warning indicator, and the CCSR on-track measure. The Chicago, Louisiana, and Philadelphia pilot intervention systems go even further by automatically providing school leaders with lists of students who have been identified as being at risk.

State and district staff and partner organizations that specialize in school improvement also can help identify appropriate interventions to use with given groups of students. The intervention guides offered by the Philadelphia and Chicago pilot programs connect the data to intervention types and categories, but leave decisionmaking to individual educators. This frees up teachers and other school staff to maximize their own expertise—putting interventions and instructional approaches into action.

3. Bringing efforts to scale

Political leadership at the district or state level can also be a powerful driver for initiating and expanding early-warning and intervention efforts. The commitment of new, dedicated funding or establishment of appropriate policies can leverage action at the local level or replicate existing efforts. New initiatives, accompanied by new funding, have supported pilot early-warning and intervention programs in Chicago, Philadelphia, Louisiana, and Ohio.

Political leaders' bully pulpits can facilitate cooperation between agencies or school districts and strengthen communication among or build joint efforts between districts. For example, observers of Louisiana's implementation of a statewide effort (described in the box below) have noted that the passion for the project on the part of the governor, the superintendent, and a state board of education member were critical to quickly implementing such a large and technically and politically challenging project.

The involvement of political leaders also increases the visibility of the data and the intervention efforts, leading to increased interest by the public and an expectation that there will be accountability for results. For example, on-track data is now included as part of the school report card that is mailed home from Chicago high schools to parents. Recent legislation passed by the Indiana legislature requires high schools to report the number of ninth graders who fail to earn enough credits for promotion to the tenth grade on their school's report card, and to implement a comprehensive intervention strategy to improve student transitions and graduation rates.

Louisiana's Dropout Early Warning Systems (DEWS)

As attention increasingly focused on the state of high schools nationally, Louisiana's low graduation rate—61 percent, according to independent estimates—could not be ignored. State leaders have recently taken a number of steps to improve student outcomes; in 2007, the Louisiana Department of Education (DOE) decided to develop and implement the Louisiana Dropout Early Warning Systems (DEWS). Just one year later, with the help of state grants, half of the state's districts (44) and special and charter schools (11) have purchased the early-warning system and begun to implement a complementary intervention system.

By managing the data and technical issues at the state level, the DOE was able to leverage partnerships and resources, while reducing the burden and duplicative efforts that would have resulted from each school or district doing this work individually. To develop the data system, the DOE contracted with a regional educational software vendor that already had an "early at-risk monitoring" module. The vendor and researchers at the state university analyzed historical data to identify trigger points for four early-warning indicators: student attendance, student course achievement, student behavior, and student age. School and district leaders automatically receive information about at-risk students twice a month.

The DOE's program has also leveraged use of the data to drive interventions. In exchange for the grant, data, and technology, participating schools are required to generate, analyze, and validate the accuracy of the DEWS data, develop an intervention program for ninth graders, and focus on students who have recently fallen off track.

Sources: A. Harris, B. Franklin, and W. Loftin, personal communication, 2008.

Federal Policy Implications

As the emerging practices in schools, districts, and states across the country take hold, federal policymakers should pay close attention to the results and lessons learned from their experiences. To support the development and effective use of early-warning data to improve student outcomes, federal policy should:

- make an increased investment in statewide data systems that also considers the need for high-quality local data systems by leveraging the alignment with such systems;
- encourage the use of early-warning and other data in the school improvement process as part of the method for differentiating among low-performing schools, designing school improvement plans, and evaluating school progress;
- use early-warning and other data to prioritize funding for school improvement to those middle and high schools with populations exhibiting risk factors;
- build capacity for schools and districts to partner with external organizations that assist with data analysis and intervention support as part of the school improvement process;
- increase the ability and willingness of educators to use early-warning and other data to inform practice by directing resources to professional development

in and collaborative time for the appropriate use of data; and
- invest in additional research on early-warning data and evaluation of accompanying interventions and practices.

By supporting the innovative use of academic data to make decisions about education policy and practice, federal policy can improve America's secondary schools and ensure that every student graduates prepared for college, work, and life in the twenty-first century.

Existing Federal Legislation

Several pieces of federal legislation have been introduced that have implications for the development and implementation of early-warning indicator systems in the nation's schools:

- Graduation Promise Act (S. 1185 and H.R. 2928)
- GRADUATES Act (S. 1920 and H.R. 3763)
- Striving Readers Act of 2007 (S. 958 and H.R. 2289)
- Statewide Data Systems bill (S. 2014) and METRICS Act (H.R. 3253)
- Success in the Middle Act (H.R. 3406 and S. 2227)

For more information visit www.all4ed.org.

Conclusion

As the nation has come to recognize the academic, civil rights, and economic imperatives of improving high school graduation rates, educators, advocates, and policymakers are increasingly interested in systemic, cost-efficient, successful approaches to secondary school reform. Simultaneously, there are calls for the use of data-driven decisionmaking to individualize instruction and ensure that all students graduate ready for college and work.

Early-warning data is one means to advance that objective. No longer should socioeconomic factors and life experiences outside the schools be considered the sole barometer of the likelihood of a student graduating from high school. And the use of early-warning data

systems to develop tiered or differentiated intervention systems has provided some guidance to educators on what exactly "data-driven decisionmaking" can look like in a school or district.

This emerging research and practice should be supported by educators, researchers, advocates, and policymakers across the country. In addition, it must be widely adapted, replicated, and further studied to ensure that more students manifesting early-warning signs receive immediate assistance to avoid falling through the cracks of the education system and graduating from high school with a meaningful diploma and an assurance that they are prepared for the challenges and opportunities of college, work, and life.

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