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USING EARLY WARNING SYSTEMS TO ENSURE STUDENT SUCCESS

To promote equity and keep all students from falling through the cracks, struggling students must be identified and supported as early as possible.

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1

WHY EVERY SCHOOL DISTRICT NEEDS AN EARLY WARNING SYSTEM

The use of EWI/EWS is based on the belief that all students can excel if they receive appropriate supports.

Guadalupe Guerrero, superintendent of Portland Public Schools (PPS)—the largest and most diverse school district in the State of Oregon—recently commented that high school graduation rates are in many ways "evident in the students when they enter kindergarten." Research confirms this astute observation, proving time and again that early intervention and success indicators matter as early as age five.

Guerrero's assertion makes the case for the use of early warning indicators (EWI) and an early warning system (EWS) in every school district throughout the U.S. The idea behind the use of these tools is simple—if you can identify student issues early on, you can strategically address student needs before struggling students fall through the cracks.

The use of EWI/EWS is based on the belief that all students can excel if they receive appropriate supports. Providing these supports adds value to the educational experience, and can put school districts well on the way to achieving the elusive goal of educational equity.

WHAT EXACTLY IS EWI/EWS?

Formal EWI/EWS frameworks have been around for several decades. The earliest of early warning systems, dating from the late 1980s, relied on one-on-one interviews with high school dropouts, in the hope of finding common, predictive risk factors that could then be applied to students still attending school. While this method produced modest results, it was limited by its lack of scientific rigor, its labor intensiveness, and its reliance on willing participants.

As the collection of student performance data became more objective and comprehensive over the years, educators were able to more accurately identify indicators that predicted academic success or failure.

In 2011, Civic Enterprises and the Everyone Graduates Center at Johns Hopkins University published the first national assessment of EWI/EWS in a landmark report called *On Track for Success*.

On Track for Success defines EWS as "a collaborative approach among educators, administrators, parents, and communities to using data effectively to keep students on the pathway to graduation." Having investigated the results of EWI/EWS as practiced in 16 selected school districts across seven states, the report identifies the traits of a successful EWS:

- Rapidly identifies at-risk students
- Rapidly applies interventions targeted to students' needs
- Frequently monitors the interventions' success
- Rapidly modifies ineffective interventions
- Shares lessons learned from the interventions

Validating and expanding on these findings, a 2018 report from the University of Chicago Consortium on School Research—*High School Graduation and College Readiness Indicator Systems: What We Know, What We Need to Know*—identifies three primary purposes for EWI/EWS:

- Identify students who need intervention
- Focus, guide, and assess school improvement progress
- Hold schools accountable for student outcomes

In this resource, we'll draw from these reports and other sources to show you how you can use EWI/EWS effectively in your district. As one of the leading providers of student assessment data platforms, all of us at Illuminate Education are committed to helping districts do whatever it takes to ensure all students are college- and career-ready.

We are firm believers that an equity-based agenda—backed by robust data analytics, innovative technologies, strong leaders willing to make extraordinary changes, and the application of EWI/EWS—is the key to fulfilling the promise of public education.

Keep reading to learn how to develop a data strategy for EWI.

2

DEVELOPING A DATA STRATEGY FOR EARLY WARNING INDICATORS

Advances in technology make it easier to identify and support at-risk children.

In the previous chapter, we discussed the ways in which early warning indicators (EWI) and early warning systems (EWS) are designed to advance an equity agenda. By identifying at-risk students early and providing them with additional supports to help them reach their highest potential, these tools enable more students to experience the rewards of steady achievement and personal development throughout their K-12 education.

In this section, we're going to talk about how you can use data to:

- Identify at-risk students
- Determine appropriate interventions
- Measure the interventions' effectiveness

WHICH EARLY WARNING INDICATORS ARE THE MOST EFFECTIVE?

The first step in creating an EWS is to determine which data points you should use as early warning indicators. Too much data can be overwhelming, so it's best to keep the core of your EWS as simple as possible. Choose a limited number of indicators proven to predict student outcomes.

Fortunately, research provides many answers. In the early 2000s, investigators from the Consortium on Chicago School Research, the Center for Social Organization of Schools at Johns Hopkins University, and the Philadelphia Education Fund determined that attendance, behavior, and course performance—collectively known as the ABCs—were the most powerful indicators of student outcomes—more powerful than demographics or test scores.

These findings have been validated by numerous other studies, which have come up with specific thresholds for each indicator in most circumstances. According to

On Track for Success, the landmark 2011 report by Civic Enterprises and the Everyone Graduates Center at Johns Hopkins University, these optimal thresholds are:

- **Attendance**: Missing 20 days or being absent 10 percent of school days
- **Behavior**: Two or more mild or more serious behavior infractions
- **Course Performance**: An inability to read at grade level by the end of third grade; failure in English or math in sixth through ninth grade; a GPA of less than 2.0; two or more failures in ninth grade courses; and failure to earn on-time promotion to the tenth grade.

Obviously, interventions should occur long before children meet these thresholds, but knowing the thresholds provides a pathway for monitoring each data point.

WHAT OTHER INDICATORS SHOULD I CONSIDER?

Having core indicators doesn't mean you can't test others along the way, but sticking with the basics, especially in the beginning, will prevent your stakeholders from being deluged with data. In addition to the ABCs, most experts agree that the addition of locally relevant indicators may improve the effectiveness of any given EWS.

Status indicators, for example, may be helpful in identifying, and ultimately reversing, patterns of institutional inequity. These include data about race and socio-economic status, as well as other factors such as having a learning disability, parent education levels, homelessness, foster care, and interactions with the justice system.

Similar to status indicators, causal indicators include mental illness in students or parents, substance abuse, a history of bullying or being bullied, low self-esteem, poor social skills, and poor time management skills.

While it's necessary to understand the key indicators that put students at risk, it can also be useful to understand indicators that lead to student success. Known as protective factors, these indicators can include things like strong attendance, engaged parents, and a high degree of persistence in managing tasks.

One more issue to consider is the use of historical, or longitudinal, data to get a fuller picture of risk factors over time, especially at key transition points such as those between Pre-K and kindergarten, elementary school and middle school, and middle school and high school. Historical data can give you a more comprehensive view of any particular student, and can also help you identify institutionalized patterns in schools and classrooms throughout your district.

STUDENT-LEVEL VERSUS SETTING-LEVEL DATA

Most of the data you'll use in your EWS can, and should, be looked at through both an individual student perspective and a school climate perspective. Let's take attendance data, for example. To identify at-risk students, you may conduct a weekly review of ninth graders, flagging unexcused absences to see if interventions are required. At the same time, for the sake of school improvement and accountability, you can review attendance data at the setting level—by period, subject, or classroom—to identify the need for systemic changes.

We'll take a closer look at these types of data in subsequent chapters, but it should be noted here that setting-level data is critical to improving instructional efforts and other student services. When a school climate is healthy, it sets the stage for optimal student learning.

DATA ANALYSIS AND TRAINING

The use of accurate data to create an effective EWS requires analysis and input from teachers, administrators, parents, community partners, and students. Without people in place to collect, analyze, and distribute data in a timely manner; to determine appropriate interventions for specific students; and to evaluate the effectiveness of interventions, the data itself doesn't mean much. Think of your EWS as a continuous inquiry cycle that requires ongoing monitoring and continuous improvement to get better results over time.

We'll go into more detail later in this guide, but best practices suggest that each school should create a leadership team to champion, implement, and manage your district's EWS. Trained staff should not only collect, analyze, and distribute the relevant data; they should also ensure that their audiences—teachers, parents, and students— understand and know how to act on the reports.

Teachers and site leaders occupy a critical position in the middle of the data pipeline. They receive data from the system, and they also need to be out on the front lines, discussing the relevant information with parents and students to drive action. Your leadership teams should provide ongoing support to help educators make meaningful use of the data that flows across their desks.

Advances in technology are making it easier than ever to compile data into digestible, intuitive reports that are easy to act on, both online in the form of a data dashboards or as printable emails or pdfs. Illuminate Education, for example, in partnership with eduCLIMBER, offers one of the most easy-to-use data visualization tools available.

IMPLEMENTING INTERVENTION PROGRAMS

After determining your data indicators and leadership teams, it's time to get to the heart of the matter: implementing intervention programs.

As districts determine their capacity to help students flagged for intervention, resources may need to be more equitably allocated based on student needs. This may require getting more funding for specific schools, seeking new community partnerships, or hiring specialized personnel.

The bottom line is that finding the resources for a full-blown EWS will likely involve a paradigm shift, some political maneuvering, and an equity-based leadership agenda that emphasizes inclusivity.

Experience has shown that it can take two to three years to fully implement an EWS in a given district. Because most successful EWS efforts are field tested in a pilot program before district-wide rollout occurs, it's important not to go too fast.

Although early warning systems are still in developmental stages, their execution has improved considerably during recent years, mainly because of greater data availability, enhanced analytics, and educational leaders committed to data-driven decision-making.

In the next chapter, we'll dive deeper into the use of student-level data to identify at-risk students.

3

STUDENT-LEVEL DATA IN AN EARLY WARNING SYSTEM: LESS IS MORE

Learn how one diverse district optimizes high school graduation rates with just two early warning indicators.

Earlier in this resource, we discussed the importance of using just a few proven early warning indicators (EWI) to avoid overwhelming teachers, administrators, parents, and students with unnecessary data points. We learned that attendance, behavior, and course performance are far and away the best indicators of student outcomes, and that these "ABCs" should form the core of any effective EWS.

In this chapter, we'll examine how the San Francisco Unified School District (SFUSD) has been using GPA and attendance data from eighth grade students to improve high school graduation rates.

SFUSD staff and researchers from the John W. Gardner Center for Youth and Their Communities (JGC) at Stanford University came together, under the auspices of San Francisco's Bridge to Success (BtS) initiative, to discuss ways to identify incoming ninth graders who need extra supports.

The JGC determined that the presence of two data points, measured at the end of eighth grade, reliably predicted an on-time graduation rate below 25%:

1. GPA below 2.0
2. Attendance rate below 87.5%

The initiative analyzed two cohorts of students (one group entering ninth grade during the fall of 2005-06 and the other in 2006-07) to determine the ability of the data points to predict graduation risk. Averaging the numbers from the two years gave researchers a single cohort of 3,382 students, with a four-year high school graduation rate of 72.9%.

Incoming ninth graders who entered high school with one of the risk factors were half as likely to graduate (43%) as students with no risk factors (84%). The graduation rate of students with two risk factors dropped all the way down to 15%. (See Figure 1.)

A total of 749 students (22%) entered ninth grade with one or both risk factors. Of the students with only one risk factor, 274 (58%) had a GPA below 2.0 and 202 (42%) had an attendance rate below 87.5%.

Of the two risk factors, GPA was the stronger predictor of failure to graduate on time: Students with a low GPA were less likely to graduate (39%) than students with low attendance (48%).

Exhibit 1. Four-Year High School Graduation Rate, by Number of Year-End Eighth Grade Risk Factors
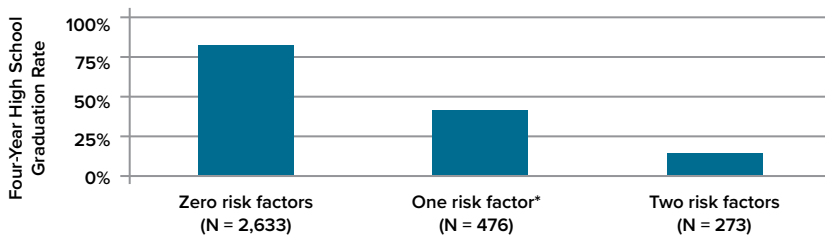

Figure 1: Graduation rates decline as the number of eighth-grade risk factors increases.

USING EWI TO PROVIDE STUDENT SUPPORTS

By analyzing eighth-grade student data through the lens of GPA and attendance, district officials can flag incoming ninth graders who might benefit from additional supports.

Summer Programs for At-Risk Students.
One promising intervention is a summer program designed to help at-risk students make a smoother transition to high school and arrest any learning loss that could take place during the long break. Because students would have to be identified earlier for recruitment in such a program, JGC researchers identified similar predictive indicators—a GPA below 2.0 and an attendance rate below 85%—measured in the middle of the eighth-grade year, rather than waiting until the end of the second semester. This approach identified 633 students with one or both risk factors.

Scaffolding Academic Success in Ninth Grade.
Support is also crucial throughout the first year of high school to ensure that all students stay on track. Figure 2 shows that, regardless of a student's risk factors, academic success in the first semester of ninth grade has a significant effect on long-term success in high school.

Students who passed all core courses in the first semester of ninth grade showed significantly higher graduation rates than students who failed even one core course, regardless of their pre-existing risk factors. Of the students with zero risk factors, 87% passed all their core courses in the first semester, but those who failed even one course had a four-year graduation rate that was 33 percentage points lower.

For those students with one risk factor, failing one or more core courses led to a 23-percentage-point drop in the likelihood of graduating. Again, course performance proves the stronger indicator of academic success: Ninth graders with a low GPA were less likely to pass all their core courses than students with low attendance.

For students with both risk factors, passing all core courses more than doubled the percentage of students who graduated, but only 26% of these students were able to pass all their core courses.

Exhibit 6. Four-Year High School Graduation Rate, by Number of Risk Factors and Course Failures in the First Semester of 9th Grade
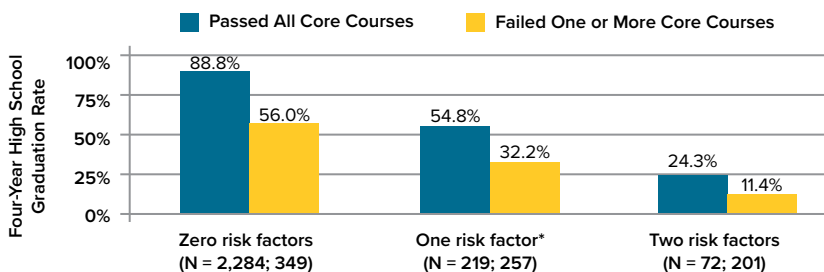

Figure 2: Failing core courses reduces graduation rates, regardless of risk factors.

This analysis points to the importance of identifying EWIs at various points in eighth and ninth grade. While eighth-grade data can capture a large proportion of likely dropouts, some students without obvious warning signs at that time will still not graduate, and the failure of a core course in the first semester of ninth grade is clearly a red flag.

OPTIMIZING YOUR EARLY WARNING SYSTEM

It's important to keep testing theories of action and look for other valuable data to enhance your EWS. If you can look at historical data for every school in your district, for example, you're likely to identify data points that may be locally relevant, such as family involvement, school climate, instructional quality, etc.

Developing an EWS requires a substantial investment of time and resources, and requires a consistent commitment to understand what it takes to identify at-risk students and help them succeed. What's more, because the number of identified students is unlikely to be divided equally among schools, strategies to improve student performance may need to be substantially different at each location.

Systemwide transformation can occur when top-level administrators understand the power of data. The 2018 report, *High School Graduation and College Readiness Indicator Systems: What We Know, What We Need to Know,* from the University of Chicago Consortium on School Research, clarifies how states and districts can use EWIs to drive student success:

- EWIs communicate district priorities for supporting at-risk students to each school.
- Education agencies can use EWIs to communicate priorities and expectations about the work in which schools should be engaged.
- Districts can use EWI data to provide milestones to monitor and support at-risk students.

In San Francisco, the use of an early warning system is working, as SFUSD continues to improve and exceed statewide graduation and A–G course completion rates. The district's 2014-15 Cohort Outcome Data shows an 84.9 percent graduation rate, compared to the state rate of 82.3 percent. The data represents a 2.8 percent increase for SFUSD since 2011-12 and a 7.7 percent increase since 2009-10. These are remarkable advances.

Interestingly, the cohort of students graduating in 2015 was the first to benefit from the district's EWS and the resulting supports. Most impressive from an equity standpoint, the graduation rate increased year over year for most traditionally underserved subgroups, including Latinos and African Americans, as well as English Learners, Special Education students, and socio-cconomically disadvantaged students.

Next, we'll learn about the importance of setting-level data in effecting positive, systemic change.

4

THE IMPORTANCE OF SETTING-LEVEL DATA IN AN EARLY WARNING SYSTEM

Systemic change can't be made with student-level data alone.

Identifying students in need of extra support is just one of the benefits of using an early warning system (EWS). As *High School Graduation and College Readiness Indicator Systems: What We Know, What We Need to Know* makes clear, an EWS should also "systematically focus, guide, and assess school improvement" and "hold schools accountable for students' outcomes." The 2011 report from Civic Enterprises and the Everyone Graduates Center at Johns Hopkins University, *On Track for Success*, also asserts that an EWS should "inform, and be integrated into, school improvement efforts."

Guiding school improvement requires early warning indicators (EWI) at the setting level—school and classroom—too, which can be used to evaluate school practices, improve school climate, and enhance teacher effectiveness. The ultimate goal of setting-level indicators, according to the University of Chicago report, is to make "changes in adult behaviors and school systems so that they are more effective in supporting students."

AGGREGATING STUDENT DATA

Setting-level indicators can come from a variety of sources. One valuable source is aggregated student-level data. We've previously discussed individual student data in relationship to the ABCs (attendance, behavior, and course performance)—three reliable indicators of student success. We learned how a weekly review of ninth-graders' attendance could identify individual students at risk.

But we also learned how the analysis of aggregated attendance data over time—by period, subject, classroom, or student subgroup—could reveal insights about a school that may suggest broader pathways to closing the achievement gap.

"Knowing a student's race, gender, or disability status may not significantly in¬crease the prediction of whether they will graduate," say researchers at the University of Chicago. "But those pieces of information aggregated at the setting level may guide decisions about potential interventions." The Chicago report goes on to cite various demographic lenses, such as gender, through which to track course performance (the C in ABC) at the setting level:

For example, a school that has considerably higher graduation rates among their girls than their boys might monitor gender differences in ninth-grade course failure rates—an early indicator of high school gradu-ation—to test strategies intended to reduce the gender gap in graduation.

Schools may then zoom in on gender differences in failure rates classroom by classroom:

Schools may . . . compare failure rates across different classes and teachers. If course failure is clustered in a few classes, interventions might be more appropriately aimed at teachers or departments, rather than individual students. On the other hand, if students are failing classes without a strong difference across subjects, the level of intervention may be more appropriately targeted at school culture and school structures.

The example above is just one way that schools can use patterns in aggregated student data to understand inequities in educational outcomes for traditionally underserved subgroups.

FOCUSING ON SEL

Social-emotional learning (SEL) data is another source of setting-level indicators that can bolster your district's EWS. Looking at aggregated SEL data may lead to the creation of safe and supportive learning environments.

SEL data is collected around five competencies—self-awareness, self-management, responsible decision-making, relationship skills, and social awareness. Schools that have implemented SEL programs have seen significant improvements in attendance rates, dramatic reductions in disciplinary referrals, and marked increases in graduation rates.

MEASURING TEACHER AND STUDENT PERCEPTIONS

Another integral way of understanding school climate and identify areas for growth is through the use of perception data. This information can make its way to educational leaders through surveys of students, parents, and teachers.

In Chicago, annual surveys probe five separate areas that map to Bryk's Five Essential Supports: leadership, instructional guidance, professional capacity systems, student-centered learning climate, and parent/school/community ties.

LOOKING AT FORMATIVE AND SUMMATIVE DATA

As with student-level indicators, setting-level data can be formative as well as summative. Formative indicators can be made available in real time and facilitate more rapid feedback. Schools, for example, could initiate a campaign to increase attendance, and check results on a biweekly or monthly basis.

Summative data, on the other hand, is generally collected at the end of a given year and can be used to make programmatic changes for the following year. If you have the ability to look at longitudinal data, you'll be even more likely to notice institutionalized patterns that may require attention.

THINKING STRATEGICALLY

Determining the right setting-level indicators to monitor involves thinking strategically about the priorities of your district. The report from the University of Chicago explains how setting-level data changed the way schools in the Windy City supported individual students:

When the district integrated on-track rates into the accountability system for high schools, it provided a signal that high schools should pay more attention to students' performance in the ninth-grade year. Before that, ninth grade was often seen as a year when students could make mistakes and still recover. Eventually, individual schools developed very different practices around dropout prevention than in the past, interventions that focused on preventing failures in the ninth grade. These changes have been credited with dramatic improvements in graduation rates in the district.

The San Francisco Unified School District has leveraged a strategic plan that details organizational aspirations. It included a graduate profile that became their North Star, guiding action at the district, site, and classroom levels to help all students find their inner spark.

With such a North Star in place, districts can begin to formulate an EWS that measures the right data, leverages the right resources, and provides the right central office supports to help every student reach their highest potential.

Content Knowledge
Ready to think, learn and grow.
We help our students master the fundamentals they need to know to succeed—like math, English, computer science, and art—and develop problem-solving and critical-thinking skills

Career and Life Skills
Ready for career, ready for life.
We help our students acquire the knowledge, skills and experience they need to navigate in the world, think critically and communicate effectively. We partner with local businesses to expose students to real challenges and learn how to solve them.

Global, Local, and Digital Identity
Ready to tackle a changing world.
We equip students with the skills they need to succeed in the future. They learn new languages, understand new technologies and participate in local apprenticeships.

KNOWLEDGE AND SKILLS

**The Graduate Profile:
Developing Students
to Compete and Thrive in
the 21st Century World**

SFUSD is committed to helping all students develop strong academic knowledge and skills, as well as a host of dispositions and behaviors, that increase their curiosity and engagement, activate their full potential for learning, and prepare them for life, work, and study beyond their secondary school years. While the pace and the path toward achieving these outcomes will vary among students and unfold along a set of learning progressions, the goal is for every SFUSD student to possess these capacities by the time they graduate.

DISPOSITIONS AND BEHAVIORS

Leadership, Empathy, and Collaboration
Ready to lead, ready to work with others.
We organize activities in teams to help students learn to work together. We also encourage students to work with partners outside the classroom, such as family members and mentors, to prepare students to both lead and collaborate.

Creativity
Ready to create.
We provide opportunities for our students to be creative and at the center of solutions. They tackle environmental problems and make their communities more inclusive.

Sense of Purpose and Sense of Self
Ready to be their best.
We believe in each and every one of our students. We nurture their growth and teach them life lessons so they can recognize their purpose and value. We encourage each student to reach their full potential, whether they require extra support or a new challenge.

Figure 3: Graduate profile from the San Francisco Unified School District.

Setting-level indicators can provide visibility into a school's progress in its effort to support all students. They can provide a fuller picture of the educational experience, so that any flaws in the system can be addressed. It is our moral imperative to serve all students, especially those who need a little extra assistance in order to excel.

We'll talk about the people behind the data, those who drive action on behalf of every student in the next chapter.

5

THE PEOPLE BEHIND THE EARLY WARNING INDICATORS

*It takes a team of engaged stakeholders to create
an effective early warning system.*

As we've been emphasizing, data alone is never enough. Data is just a tool that educators can use to identify and remove possible barriers to student success. And because many inequities are built into our educational system, we need people at all organizational levels who know how to collect, analyze, and proactively act on data on behalf of students.

According to *High School Graduation and College Readiness Indicator Systems: What We Know, What We Need to Know*, it's "the efforts and actions of individuals in different roles that make indicators effective … policymakers, school leaders, teachers, school staff, and outside partners all play important roles…."

Figure 4, from the report, shows how these different stakeholders can work together to optimize the effectiveness of an early warning system (EWS).

FIGURE 1

The Use of Indicators for Improving Student Outcomes

SCHOOL

District & State Policymakers use indicators to hold schools accountable for student outcomes

- Provide data systems
- Signal priorities through school reports and accountability indicators
- Provide resources to support indicator use

School Support Organizations use indicators to facilitate the use of indicator data in districts & schools

- Help organize data
- Facilitate tough discussions
- Enable learning across schools
- Connect the use of indicators for accountability, school improvement, and intervention

School Leadership Teams use indicators to guide school improvement

Meet around setting-level indicator data
- Test assumptions
- Develop strategies
- Assess progress
- Judge program effectiveness

Teacher and School Staff Teams use indicators to identify students in need of intervention

Meet around student-level indicator data
- Coordinate support of particular students
- Advise each other on how to support students

Student Outcomes Improve

Indicator use provides students with:
- More targeted support
- Earlier intervention
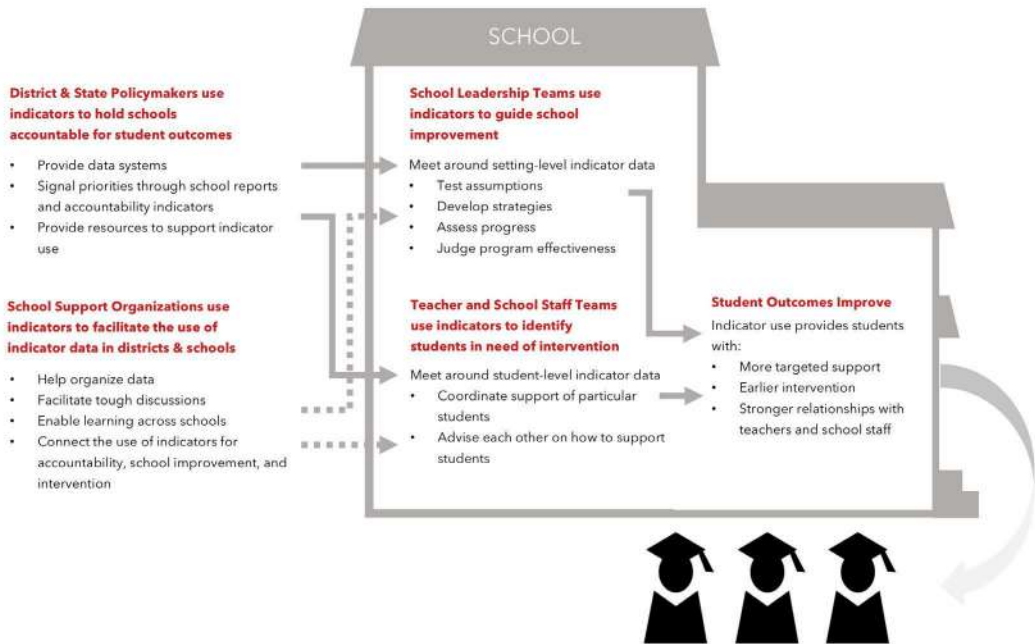- Stronger relationships with teachers and school staff

Figure 4: Effective early warning systems require teams of people who understand how to work with data for the benefit of all students.

DISTRICT LEADERSHIP TEAMS

At the top, district and state policymakers must continue their commitment to being data driven. They must select a quality data system, establish priorities, provide adequate resources, and build a high-quality leadership team. The ideal leadership team should include educators, community and business leaders, and representatives from schools. This team should spearhead a range of initiatives—from reviewing your district's current intervention program and recruiting talent for incorporating an EWS, to establishing ownership among key stakeholders.

SCHOOL LEADERSHIP TEAMS

At the site level, school-based teams should be tasked with running and optimizing the EWS for their own location: testing assumptions, developing strategies, assessing progress, and making any necessary adjustments. Team members should work with setting-level data to guide school improvement and use student-level data to identify and provide support to at-risk students. One of the most important responsibilities of school leadership teams is to train teachers to collect data and turn it into action on the students' behalf. Instructional technology experts are often the best qualified to conduct this training.

TEACHER AND SCHOOL STAFF TEAMS

Teacher and school staff teams should focus on student-level indicators, using data to identify at-risk students and provide them with appropriate supports to be successful. In an ideal scenario, educators who work with the same students should team up to coordinate academic, behavioral, and social-emotional supports.

The University of Chicago report highlights the importance of school-to-home communication, providing this example:

...a school might regularly send out information about its prog¬ress in meeting overall attendance goals, along with a summary of research findings on the relationship between attendance and learning gains or educational attainment. This can help families make the connection between their own child's attendance, their goals for their child's educational attainment, and the broader goals of the school.

Teachers are often the best link to parents. By helping parents understand the links between data and student outcomes, they can play a critical role in EWS.

SUPPORT ORGANIZATIONS AND CONSULTANTS

Many districts can benefit from external support services and consultants who have experience in data collection and analytics. Because every EWS is complex and requires considerable amounts of time and knowledge, outside organizations can often provide the expertise, support, and training districts need to ensure sustainability.

COMMUNITY PARTNERSHIPS

Whether or not a school uses outside consultants or support services, school leadership teams should search for community-based organizations that might be able to help students with tutoring, internships, or health services. Community partners can provide a valuable boost to school EWS programs.

Data is necessary to drive positive change for all students, but it's people who really make the difference. As you consider implementing an EWS for your district, make sure your staff is prepared to work with data to help students succeed.

Now, we'll discuss using an EWS in elementary and middle schools.

6

EARLY WARNING SYSTEMS IN EARLY EDUCATION

There's no such thing as too early when it comes to an early warning system.

As you may recall, we began with the assertion that in many cases, the likelihood that a student would graduate from high school could be predicted as early as kindergarten.

Because early warning systems were initially designed to improve high school dropout rates, most of the research has centered around students in eighth grade and up. Another important branch of EWS research has focused on getting high school students ready for college.

All that work at the high school level is admirable, but younger students shouldn't be ignored. Why not start as early as possible to use early warning indicators (EWI) to support our students?

According to *On Track for Success*, proven predictive indicators known as the ABCs—attendance, behavior, and course performance—are just as powerful in the early grades. In the course performance category, for example, the inability to read at grade level by the end of third grade and failure in English or math in sixth grade or later are thresholds that should alert educators that extra supports are needed.

The report cites several examples of studies that show the importance of monitoring EWIs in younger students, including:

- *A longitudinal study of more than twenty thousand K-5 students from 900 schools across the country, which found a strong link between early absenteeism and later struggles in school.*

- *A study of San Diego fourth graders, which revealed a strong correlation between GPA and classroom behavior and later success on the California High School Exit Exam (CAHSEE).*

- *Another longitudinal study of nearly 4,000 students, which found that those who could not read proficiently by third grade were four times more likely to leave school without graduating than proficient readers. (Note that this indicator is not predictive on its own; some students who read still drop out.)*

- *Longitudinal studies by the Baltimore Educational Research Consortium (BERC), which confirmed earlier findings that large percentages of future dropouts could be identified as early as sixth grade.*

If districts are serious about equity, they should implement an EWS as early in a student's career as possible. The data is available, and so are the platforms for collecting, storing, and visualizing data to create effective supports for at-risk students.

In the next chapter, we'll talk about the future of EWS and the challenges and opportunities that lie ahead.

7

THE FUTURE OF EARLY WARNING SYSTEMS

With more data, analytics enhancements, and further research,
early warning systems will become even more powerful
tools in the quest for equity.

Machine learning will be the next big thing to support teachers, and its use in the development of early warning systems (EWS) is just one example of how technology, combined with data, can be a game-changer for closing the achievement gap.

With the ability to gather information from large-scale databases, computers can detect patterns at tremendous speeds and at increasingly granular levels. Based on these patterns, educators will be able to match students with effective early warning indicators (EWI) and appropriate supports.

It's an exciting time to be involved in the implementation and management of an EWS. As more district officials see the value of EWSs and work to make them even more effective, we will change the lives of many more students.

There is still work to be done to help every student succeed, but the future of EWS as a way to achieve equity holds great promise. According to *High School Graduation and College Readiness Indicator Systems: What We Know,* *What We Need to Know*, continued research is needed in the following three areas to help every student graduate high school:

1. Improving Students' Grades: The Impact of Teacher Beliefs, School Policies, Student Interventions, and Instructional Practices

Because a student's GPA is a powerful predictor of high school graduation, grades must accurately reflect a student's abilities. Research on tactics designed to improve GPAs should continue, in order to see which techniques are most effective. Popular tactics include online portals, no-zero policies, and instructional practices designed to improve non-cognitive skills that academic assessments can miss. On the other hand, factors that can interfere with GPA honesty should also be analyzed, such as grade inflation, student sorting, and beliefs that failure can be valuable.

2. The Relationships of Setting-Level Indicators of School Climate with Educational Attainment and Achievement

In chapter 4, we talked about aggregating student data to identify patterns related to the school setting. We also touched on social and emotional learning (SEL), surveys, and other strategies for understanding the effect of school climate on student success. More research is needed, according to the University of Chicago report, to answer the following questions:

- What is the longitudinal relationship between survey measures of school climate and early warning indicators?
- Is there an identifiable sequence of steps in a school-climate improvement strategy?
- How do schools use data to improve school climate?

3. How Indicators Are Being Used to Improve Educational Attainment

An important quality of an effective EWI is its malleability. GPA, for example, is a malleable indicator: A student with a low GPA can potentially attain a higher GPA. Clearly, it's not enough simply to identify at-risk students through the use of EWIs. Educators must also understand how to follow through, to improve the problems that EWIs reveal. But, according to the University of Chicago report, "there is currently little documentation of how indicators are being used." The report calls for investigation into these areas of inquiry:

- Which approaches effectively improve student outcomes?
- What systems and structures are needed to support these approaches?
- How can we develop the capacity of practitioners to use and act on EWIs?

Throughout this guide, we have covered considerable ground on the topic of developing and implementing an EWS. The hope is that you've gained an appreciation of the power of data to effect positive change for students. Across the country, districts like yours are using Illuminate to collect, store, distribute, visualize, and analyze both student- and setting-level data—from statistics on academic achievement and teacher effectiveness to data on social-emotional learning and school climate. Though each district is unique, they share the belief that all students deserve the chance to reach their highest potential and live fulfilling lives after high school.

Perhaps, you might consider using our solution as you develop your own EWS and work toward advancing an equity agenda. Reach out to learn more.

SOURCES

Allensworth, E.M., Nagaoka, J., & Johnson, D.W. High school graduation and college readiness indicator systems: What we know, what we need to know (2018). Chicago, IL: University of Chicago Consortium on School Research.

Bruce, M., Bridgeland, J.M., Hornig Fox, J., & Balfanz, R. On track for success: The use of early warning indicator and intervention systems to build a grad nation (2011). Washington, D.C.: Civic Enterprises & Everyone Graduates Center.

Developing Early Warning Indicators for the San Francisco Unified School District (2011). Stanford, CA: John W. Gardner Center for Youth and Their Communities, Stanford Graduate School of Education.

San Francisco Unified School District 2014-15 Cohort Outcome Data (2016). San Francisco, CA: SUSFD.

Illuminate Education partners with K-12 educators to equip them with data to serve the whole child and reach new levels of student performance. Our solution brings together holistic data and collaborative tools and puts them in the hands of educators. Moment-by-moment, our users can visualize each student's progress, determine the right instructional or intervention strategy, and take the next best action. Headquartered in Irvine, CA., Illuminate supports over 17 million students and 5200 districts and schools across all 50 states.