COLLEGE & CAREER
READINESS & SUCCESS Center
at American Institutes for Research

Evidence-Based Practices to Support College and Career Readiness in High School

Early Warning Indicators

The Every Student Succeeds Act (ESSA; 2015) requires states to identify high schools with a graduation rate less than 67% as low performing. Each low-performing high school is required to implement an evidence-based intervention to improve student outcomes. Although the number of interventions that are associated with improved outcomes for high school students is limited, early warning indicators represent an intervention with evidence. Figure 1 presents the four levels of evidence used by the U.S. Department of Education. Early warning indicators provide a means of screening and identifying students who are at risk of not graduating from high school on time, thus allowing adults in the high school to intervene and provide support to get students back on track for high school graduation.

This snapshot is part of a series by the College and Career Readiness and Success Center highlighting evidence-based practices that support practices to promote college and career readiness in high schools.

Early Warning Indicators

Early warning indicators are used for early identification and intervention with students to help them get back on track and meet major educational milestones, such as on-time graduation and college and career readiness (Blumenthal, 2016b). Early warning indicators work by using data that are readily available and routinely collected to identify students at risk (O'Cummings & Therriault, 2015). Importantly, these data represent student behaviors (e.g., attendance and course performance) that are malleable and thus will show change as students get back on track for high school graduation (Li, Scala, Gerdeman, & Blumenthal, 2016).

Figure 1. Levels of Evidence

To support the identification and selection of evidence-based interventions, the U.S. Department of Education developed four levels of evidence.

Strong Evidence

Interventions with **strong evidence** have at least one experimental study that shows a statistically significant and positive effect without being overridden by other statistically negative evidence. The study must have a large, multisite sample with overlap in both population and setting.

Moderate Evidence

Interventions with **moderate evidence** have at least one quasi-experimental study that shows a statistically significant and positive effect without being overridden by other statistically negative evidence. The study must have a large, multisite sample with overlap in either population or setting.

Promising Evidence

Interventions with **promising evidence** have at least one correlational study that shows a statistically significant and positive effect without being overridden by other statistically negative evidence.

Demonstrates a Rationale

Interventions that **demonstrate a rationale** are those with a well-specified logic model informed by research or evaluation where relevant research suggests the likelihood of positive effect and a study of the effects will occur as part of the intervention or is under way elsewhere.

What Are the High School Indicators?

The majority of early warning indicators are measures of attendance and course performance (Bruce, Bridgeland, Hornig Fox, & Balfanz, 2011; Li et al., 2016). These indicators have been identified through research to be highly predictive of student outcomes (Heppen & Therriault, 2008), such as on-time high school graduation. To successfully use these indicator thresholds, which are specific values that predict whether a student will meet the predetermined outcome of interest without intervention, need to be determined (Li et al., 2016). However, some variation exists in the accuracy or predictive power of these indicators across different grade levels and districts (Li et al., 2016). Frequently used ninth-grade indicators and their accompanying typical thresholds are detailed Table 1.

Table 1. Frequently Used Ninth-Grade Indicators and Thresholds

Ninth-Grade Indicators	Description	Threshold	Evidence-Based Rating
 **First 20- or 30-day attendance** (Allensworth & Easton, 2007)	The number of absences within the first 20 or 30 days of each grading period is the biggest risk factor for failing ninth grade (Neild & Balfanz, 2006). This indicator is particularly important because the data are available early in the school year, allowing for timely intervention.	Missed 10% or more of instructional time	 PROMISING EVIDENCE
 **Attendance** (Allensworth & Easton, 2005, 2007)	Attendance is a frequently used indicator because attendance during the first year of high school is directly related to high school completion rates (Heppen & Therriault, 2008).	Missed 10% or more of instructional time	 STRONG EVIDENCE
 **Course failures** (Allensworth & Easton, 2007)	This indicator applies to failures in any subject, not just the core content areas (English, mathematics, science, or social studies). This indicator is strongly related to the next indicator, grade point average (GPA).	Failed one or more courses per grading period	 STRONG EVIDENCE
 **GPA** (Allensworth & Easton, 2007)	If using a 4.00 GPA (rather than a weighted average) as the norm, students are considered off-track if they have a GPA of 2.00 or lower following each grading period and at the end of the year. This calculation includes all credit-bearing classes.	2.00 (less than half the maximum attainable GPA)	 STRONG EVIDENCE
 **On-track indicator** (Allensworth & Easton, 2007)	This composite indicator is the minimal expected level of student performance (Allensworth & Easton, 2007). To be considered on-track, a student must have accumulated enough credits for promotion to the next grade and have no more than one failing grade in a core subject (English, mathematics, science, or social studies) by the end of the school year.	Either two or more core course failures or a failure to earn enough credits to be promoted to the next grade	 STRONG EVIDENCE

The Evidence for Indicators

Starting in the early 2000s, researchers from the University of Chicago Consortium on Chicago School Research, the Center for Social Organization at Johns Hopkins University, and the Philadelphia Education Fund began to examine the factors that were most predictive of students dropping out of high school prior to graduation (Heppen & Therriault, 2008). Since then, a strong research base has been established for the attendance and course performance indicators. Because behavioral data vary widely by location, such data have a weaker evidence base than the other indicators (Allensworth & Easton, 2007).

Attendance. A strong correlation exists between attendance and on-time graduation (O'Cummings, 2015). Allensworth and Easton (2007) found that students with extremely high absenteeism rates (missing one month or more of class each semester) have less than a 10% chance of graduating on-time (O'Cummings, 2015). However, moderate absenteeism rates can still be problematic; only 67% of students who missed 1 week of school per semester proceed to graduate on-time (O'Cummings, 2015). However, attendance is less predictive than the on-track, GPA, and course failure indicators because the attendance indicator does not differentiate between students who are attending school consistently but performing poorly from students who are attending school consistently and performing well (O'Cummings, 2015).

Course Performance. Course performance can be measured in a variety of ways, including course failures, credit accumulation, and grades (Allensworth & Easton, 2007). Ninth-grade performance was found to have a strong correlation with high school graduation, with almost all students (95%) averaging a B or higher at the end of their freshman year proceeding to graduate on time (O'Cummings, 2015).

Composite Indicators. Allensworth and Easton (2005) found that the on-track indicator is highly predictive of on-time graduation, with students on track being nearly four times more likely to graduate on time than students who are off-track. However, composite indicators are not precise enough to provide actionable information to determine interventions for students (O'Cummings, 2015).

State Policy Considerations

States can support the use of early warning indicators through various strategies. States have incentivized the use of early warning indicators by validating such indicators for use by schools and districts, monitoring early warning indicators to identify needs and allocate resources, and collecting early warning indicator data from districts and schools.

Validating Indicators. The thresholds presented in Table 1 are based on research conducted in Chicago, Illinois; Baltimore, Maryland; and Philadelphia, Pennsylvania. However, further research has found that some variation in the accuracy of cut points exists across contexts (Allensworth & Easton, 2007). By validating indicators, states can ensure that the data are more applicable and meaningful to their local contexts (O'Cummings, 2015). In addition, validating indicators can increase the legitimacy, or predictive power, of the indicators for schools within a state (Allensworth & Easton, 2007). For example, the Minnesota Department of Education, the Wisconsin Department of Education, and the Massachusetts Department of Elementary and Secondary Education have each validated early warning indicators using student data in their own states (O'Cummings & Therriault, 2015). For more information on validating indicators, see the *District Guide for Creating Indicators for Early Warning Systems* (Li et al., 2016).

Monitoring Indicators. Using early warning indicators to monitor student progress require a larger implementation framework for providing supports to students. By examining early warning indicators at the student, school, and district levels, stakeholders can monitor student progress and identify needs. It is critical to monitor these indicators at the school level to identify students who are at risk and provide support, but it is valuable to look at these data at the district and state levels to identify trends in need and promising interventions and allocate resources to support larger scale improvement efforts (American Institutes for Research & Massachusetts Department of Elementary and Secondary Education, 2014; Therriault, Heppen, O'Cummings, Fryer, & Johnson, 2010).

Formative Progress Measures. States and districts can encourage the use of early warning systems as part of a process of formative feedback on progress toward improving student graduation outcomes and as proximal or early measures for progress toward outcomes. For example, a state or district may require schools to provide information on the percentages of students who are at risk based on early warning indicators as part of a monitoring and reporting process (Blumenthal, 2016a). Early warning indicator data are predictive, yet some states are including the data as part of a state accountability process. For instance, the California Department of Education reviews high school graduation data as part of middle school reporting. As another example, one state education agency required grantees (districts) of a summer bridge program to report on early warning indicators, including attendance, course performance, GPA, and credits earned for all students who participated in the program through ninth grade (O'Cummings & Therriault, 2015). Another state education agency required each low-performing high school to report on the percentages of students at risk by each early warning indicator. Such programmatic mandates can be used as an entry point for a state to begin to engage districts and schools in using early warning indicator data.

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