Early Warning Systems in Transition Annotated Bibliography

Prepared for NTACT, 2016, by Mathew Klare and Bradley Stevenson, UNC Charlotte
Updated, 2017, by Misty Terrell, UNC Charlotte

What is Early Warning Systems in Transition?

Early warning systems (EWS), in the context of secondary transition, are tools that analyze individual student-level data and estimate each student's risk of dropping out of school or completing school on time. Such tools generally consider three primary types of data—commonly referred to as the A, B, Cs: attendance/absence data, behavior/discipline data, and course performance/credit accrual data (Mac Iver & Mac Iver, 2009). Based on the values of variables examined in each of these categories, a student is assigned a numeric score, which is compared to a series of cut points that delimit a series of risk levels (e.g., low, medium, high risk).

Some EWS provide additional information about a student beyond his or her risk of dropping out. For example, the NTACT Risk Calculator indicates the area(s) in which a student might need additional interventions or supports to stay in school and be successful. Tools like this may evaluate additional data beyond the basic A, B, Cs, described above, to provide such diagnostic information about the student.

Why is Early Warning Systems in Transition Important?

Early warning systems and other tools that examine student- and system-level data can play an integral part in identifying needs related to school completion and their root cause(s) (Dynarski, et al., 2008). At the school building or system level, these tools can identify universal needs, such as the need for an attendance program or needs related to academic programming, and the scale or magnitude of the needs. They can also help target interventions to group(s) of students who are doing poorly in a particular area. For example, building-level data might show the majority of 7th graders doing poorly in algebra, which would suggest that the school should review and perhaps adjust its 7th grade math curriculum, instruction, and interventions for that group of students. At the individual student level, EWS can be used to help place specific students in appropriate intervention groups and follow their progress over time to ensure they are on track for a successful transition to post-school life (Bruce et al., 2011).

What Does the Literature Say About Early Warning Systems in Transition?

The focus of the literature addressing EWS is primarily on school completion (i.e., dropout prevention and graduation), rather than on secondary transition *per se*, and is aimed at practitioners. Dropout and graduation are both critical to a successful secondary transition to post-school life, so this focus is not surprising. Many EWS article address the predictors of success for various grades (Allensworth, Gwynne & de la Torre, 2014) and how EWS can be implemented to identify interventions and supports that will help students remain in school and succeed (Frazelle & Nagel, 2015). Below the various publications are summarized according to the type of research (i.e., experimental, correlational, descriptive, discussion, reviews)

References

Allensworth, E., Gwynne, J.Q., Moore, P., de la Torre, M. (2014). *Middle Grade Indicators of Readiness in Chicago Public Schools.* Chicago: Chicago Consortium on Chicago School Research. Retrieved from https://consortium.uchicago.edu/sites/default/files/publications/Middle%20Grades%20Report.pdf

Bruce, M., Bridgeland, J. M., Fox, J. H., & Balfanz, R. (2011). *On track for success: The use of early warning indicator and intervention systems to build a grad nation.* Retrieved from Johns Hopkins University, School of Education, Everyone Graduates Center website: http://new.every1graduates.org/wp-content/uploads/2012/03/on_track_for_success.pdf

Dynarski, M., Clarke, L., Cobb, B., Finn, J., Rumberger, R., & Smink, J. (2008). *Dropout Prevention: A Practice Guide* (NCEE 2008–4025). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc.

Frazelle, S., and Nagel, A. (2015). *A practitioner's guide to implementing early warning systems* (REL 2015–056). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Northwest. Retrieved from http://ies.ed.gov/ncee/edlabs

MacIver, M. A. and MacIver, D. J. (2009). *Beyond the indicators: An integrated school-level approach to dropout prevention.* Arlington, VA: The George Washington University Center for Equity and Excellence in Education.

Experimental

Balfanz, R., Legters, N., & Jordan, W. (2004). Catching up: Impact of the Talent Development Ninth Grade Instructional Interventions in reading and mathematics in high-poverty high schools [Report 69]. *Center for Research on the Education of Students Placed at Risk*. Retrieved from: http://files.eric.ed.gov/fulltext/ED484524.pdf

- This study examined the effects of the Talent Development High Schools (TDHS) instructional program in reading and math on the achievement reading and math achievement of students in high poverty schools in urban districts.
- The researchers compared the performance of students in three high schools in Baltimore to three matched schools from 8th to 9th grade. Confounding variables including age, attendance, gender, and prior achievement were controlled for.
- Results indicated students in the TDHS significantly outperformed students in the comparison schools in both gains and overall level of achievement.

Hickman, G. P., Bartholomew, M., Mathwig, J., & Heinrich, R. S. (2008). Differential developmental pathways of high school dropouts and graduates. *The Journal of Educational Research*, *102*, 3-14.

- This study looked to answer two research questions. First, whether differences existed in the developmental pathways of high school dropouts and high school completers. Second, if differences were found, with which variables did differences occur and when.
- Variables included (a) specific course grades, (b) GPA, (c) core classes, (d) proficiency test scores, (e) grade retention, (f) absenteeism, (g) family and demographic variables, and (h) county juvenile court records.
- A random sample of 60 dropout outs and 60 completers was taken from the 2002-2005 cohorts. Descriptive statistics and independent *t*-tests were used to compare the variables across cohorts.
- Dropouts significantly performed lower on all course performance grades and standardized tests and demonstrated significantly heightened levels of grade retention, absenteeism, and behavior problems than did graduates.

Correlational

Allensworth, E. M., Gwynee, J. A., Moore, P., & de la Torre, M. (2014). *Looking forward to high school and college: middle grade indicators of readiness in Chicago Public Schools* (Research Report). Retrieved from the University of Chicago Consortium on Chicago School Research website: https://consortium.uchicago.edu/sites/default/files/publications/Middle%20Grades%20Report.pdf

- This report presents findings from an analysis looking at the relationship between Chicago Public School student performance in middle school (i.e., 5th-8th grade) and their ensuing performance in high school and postsecondary education. Correlational and descriptive statistics are presented.

- First, data from middle school can create simple indicator systems for predicting high school graduation and college readiness. Within that, grades and attendance in middle school are the strongest predictors of later grades and course failure, GPAs from different middle schools have up to half a point of variation, test scores are weak indicators relative to grades and attendance, and that "readiness" for high school depends on the 9th grade context, as well as middle school performance.
- Second, though indicators from middle school can identify high risk students, high school warning systems remain important. This is because many students in Chicago Public Schools had a dramatic decline in attendance and grades after entering high school.
- Third, student attendance throughout middle school varied more than grades, and both attendance and grades varied more than test performance. As such, interventions to improve middle school attendance may be extremely impactful on high school and college graduation.

Balfanz, R., Herzog, L., & Mac Iver, D. J. (2007). Preventing student disengagement and keeping students on the graduation path in urban middle-grades schools: Early identification and effective interventions. *Educational Psychologist, 42*, 223-235.
- This study examined the accuracy of four indicators of graduating on time or within one year of the anticipated graduation date.
- Longitudinal data for 13,000 students from 1996-2004 were used to analyze the predictive power of four flags. These included academic performance (i.e., standardized test scores, final sixth grade grades), behavior challenges (i.e., behavior marks in each course, in-school suspensions, out of school suspensions), attendance (i.e., total days absent, percentage attending fewer than 80% of days), and status variables (i.e., special education status, ESL, being one or more years too old for a grade).
- Each flag was found to be statistically significant. Chronic absentees were 68% less likely than others to graduate, those who had unsatisfactory behavior scores were 56% less likely, those who failed math were 54% less likely, and those who failed English were 42% less likely.
- Last, the authors reviewed the Talent Development Middle Grades reform model and other targeted strategies to address the issue.

Burke, A. (2015). *Early identification of high school graduation outcomes in Oregon Leadership Network schools* (REL 2015–079). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Northwest. Retrieved from http://ies.ed.gov/ ncee/edlabs.

- This study examined the graduation outcomes and variables related to those outcomes for students in four Oregon school districts who entered 9th grade in the 2007-2008 school year.
- Specific outcomes examined were dropping out within four years of entering high school, not graduating after four years of high school, and on-time graduation. Analyses revealed that outcomes were associated with gender, English learner student status, and attendance and GPA in grades 8 and 9.
- Four indicators highlighted as particularly important were (a) attending fewer than 80% of days in 8th grade, (b) attending fewer than 80% of days in 9th grade, (c) GPA below 2.0 in 8th grade, and (d) GPA below 2.0 in 8th grade.

Ensminger, M. E., & Slusarcick, A. L. (1992). Paths to high school graduation or dropout: A longitudinal study of a first-grade cohort. *Sociology of Education*, 95-113.
- This longitudinal study examined the links between various 1st grade factors and later dropout for a cohort of 1,242 students.
- Participants were from the Woodlawn Community in Chicago, and enrolled as 1st grade students in the 1966-1967 school year. The community was 97% African-American, had a low-median income, high unemployment, and 22.8% of families lived below the poverty line.
- Researchers compared dropouts to graduates on several factors including (a) family background, (b) school behavior and performance, (c) family involvement in school, (d) parent-child interaction concerning school, and (e) family educational values and expectations on dropout and graduation.
- Results revealed that low grades and reported aggressive behavior was related to dropout for males, poverty decreased the relation between early school performance and graduation, a mother with a high school education or more increased the odds a male who performed poorly or had low expectations would graduate, strict rules for school mitigated early poor performance for girls, and more.

Johnson, E. & Semmelroth, C. (2010). The predictive validity of the early warning system tool. *NASSP Bulletin, 94*, 120-134.

- This study examined the predictive capability of the Early Warning System (EWS) tool on successful graduation when applied to two suburban schools as part of an RtI system.
- Developed by the National High School Center, the EWS tool analyzes data collected on indicators from students' first year in high school that research have found to predict high school completion (i.e., attendance, course performance). More specifically, the EWS measures: (a) absenteeism rate; (b) course failures; (c) GPA; and (d) on-track indicator, which is a combination of core courses failed and the total credits earned during a student's freshman year.

- Results supported the predictive ability of the EWS tool, identifying 96% and 100% of students who dropped out from the two schools.

Neild, R. C., Stoner-Eby, S., & Furstenberg, F. (2008). Connecting entrance and departure the transition to ninth grade and high school dropout. *Education and Urban Society, 40*, 543-569.

- This study was conducted to identify variables that reliably predict students dropping out of high school within six years using data from the Philadelphia Education Longitudinal Study.
- Variables that increased the probability of dropping out were if a student was Latino, was a male, received welfare, had higher rates of Ds or Fs in eighth-grade, was older, had friends who engaged in risk-taking behaviors, and ninth-grade course failure.
- Variables that decreased dropping out were if a student had a parent with at least a 2-year college degree, stronger math skills, better eighth-grade attendance, greater eighth-grade academic engagement, and/or was enrolled in special education.
- Because of the strength of the ninth-grade variables the authors concluded that, although the process of dropping out might begin early on in a student's educational career, the transition to high school is a pivotal year for changing that trajectory.

Suh, S., Suh, J., & Houston, I. (2007). Predictors of categorical at-risk high school dropouts. *Journal of Counseling & Development, 85*, 196-203.

- This study examined variables that contributed to dropping out for three groups of students who were at-risk. These groups were students with a low GPA, students who had been suspended, and students from low socioeconomic families.
- Data from the National Longitudinal Survey of Youth 1997, a nationally representative sample of youth who were 12–16 years old as of December 31, 1996, were used.
- A number of variables were identified, but they differed across groups. The five variables that consistently predicted dropout for all groups were (a) number of days absent, (b) number of household members, (c) mother's highest level of education being high school or less, (d) number of schools attended, and (e) first sexual experience occurring at 15 or younger. Three variables that were negatively correlated with dropout were (a) living with both biological parents, (b) percentage of peers who planned to go to college, and (c) whether they were optimistic about their future.

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- The authors concluded that students who dropout are affected differently by different variables, and therefore strategies should be tailored to the at-risk group status.

Uekawa, K., Merola, S., Fernandez, F., & Porowski, A. (2010). *Creating an early warning system: Predictors of dropout in Delaware.* Mid-Atlantic Regional Education Laboratory.

- This technical assistance report sought to identify indicators associated with dropping out in Delaware, the odds of students dropping out based on those indicators, and the optimal cut points for those indicators.
- The key indicators identified were attendance, math course grades, and English language arts (ELA) grades. Identified high school cut points were attendance rate of 88%, math course grades that are 0.47 standard deviations below the mean, and ELA course grades that are 0.63 standard deviations below the mean.
- The authors conclude with suggestions for developing and early warning system and increasing cut-point precision. These include grouping students according to the number of risk indicators they exhibit and basing intervention off of that.

Descriptive

Allensworth, E. M., & Easton, J. Q. (2005). *The on-track indicator as a predictor of high school graduation* (Report). Chicago, IL: University of Chicago, Consortium on Chicago School Research. Retrieved from http://consortium.uchicago.edu/sites/default/files/publications/p78.pdf
- This report examined the connection between being on-track in the freshman year and graduating. On-track was defined as a student earning the minimum number of course credits to be promoted to the 10th grade (i.e., five) and failing one or fewer semesters in a core course (i.e., English, math, science, social studies).
- Results demonstrated that on-track students at the end of freshman year are greater than 3.5 times more likely to graduate on time than off-track students. Thus, freshman course performance was closely linked with graduation from high school.

Allensworth, E. M., & Easton, J. Q. (2007). *What matters for staying on-track and graduating in Chicago Public High Schools: A close look at course grades, failures, and attendance in the freshman year* (Research Report)*.* Chicago, IL: University of Chicago, Consortium on Chicago School Research. Retrieved November 8, 2008, from http://ccsr.uchicago.edu/publications/07%20What%20Matters%20Final.pdf
- This report extended the research done in the original on-track indicator research report (Allensworth & Easton, 2005).

- Since Allensworth and Easton (2005) demonstrated the importance of freshman year in predicting dropout and graduation, this report examined a variety of indicators of freshman performance to identify factors the influence having a successful freshman year.
- Researchers found attendance is the strongest predictor of course failure, boys fail more often than girls, and performance on eighth grade tests affected ninth grade success. They also reported students' attendance and performance increases if they (a) have a strong relationship with teachers, (b) believe school is an important part of their future, and (c) have peer support for academic achievement.

Balfanz, R., & Legters, N. (2004). *Locating the dropout crisis. Which high schools produce the nation's dropouts? Where are they located? Who attends them?* (Report 70). Retrieved from ERIC database. (ED484525)
- The purpose of this study was to detail the dropout crisis in America. Specifically, it sought to: (a) identify how many high schools had severe dropout problems; (b) describe the locales, cities, and states where those high schools were located; and (c) report on the students who attend those schools.
- Some of the key findings were as follows. First, there were 900-1,000 high schools where students only had a 50% chance of graduation. Second, close to 50% of African-American students and close to 40% of Latino students attended high schools where graduation was not the norm, whereas only 11% of white students attended these schools. Third, poverty was identified as the key predictor of high schools with weak promoting power as majority-minority schools with greater resources had the same promoting power/rates as majority white schools. Last, high schools with poor promoting power were concentrated in northern cities, western cities, and across the southern states.

MacIver, M. A. (2010). *Gradual disengagement: A portrait of the 2008-09 dropouts in the Baltimore city schools*. Baltimore Education Research Consortium.
- This report described students who dropped out from the Baltimore City Schools in the 2008-2009 academic school year. Specifically, it reported demographic characteristics of students, and then analyzed the behavioral characteristics of students in the years leading to 2008-2009.
- Demographically, dropouts were more likely to be male, in special education, 17 or older, and overage for their current grade. Behavioral characteristics showed most dropouts had chronic patterns of absenteeism and course failure. Also, half of the dropouts had been suspended one or more times in the three years before suspension.
- The authors concluded the majority of intervention to prevent dropping out should occur during the early years of middle school.

Neild, R. C. (1998). *Parents and the transition to high school in Philadelphia public schools* [Research report]. Retrieved from: http://www.philaedfund.org/research/research-reports?page=3

- This study was conducted to determine (a) the extent to which parents are involved in their child's 9th grade year, (b) the nature of that involvement, and (c) parents' opinions about their child's education, and (d) parents' goals for their child's education.
- Reported help with homework decreased between 8th and 9th grade. However parental monitoring and management remained consistent. Although parental intervention did not decrease, the effectiveness of parental intervention decreased significantly.
- Parents' opinions of their children's schools were high in general, with magnet schools receiving the best ratings and neighborhood schools receiving the lowest. Finally, as a result of the challenges of the 9th grade year, parents reduced their goals for their child.

Neild, R. C., & Balfanz, R. (2006). *Unfulfilled promise: The dimensions and characteristics of Philadelphia's dropout crisis, 2000-2005*. Philadelphia Youth Network.

- This descriptive study analyzed the dropout crisis in Philadelphia to identify the demographics, trends, and potential indicators of being at high risk for dropping out.
- Demographic analysis revealed that on time graduation rates ranged from 45%-52% and no ethnic group had an on-time graduation rate higher than 71%. For males of the 2000-2003 classes 40% of Latino males graduated in six years, 50% of African-American and White males completed high school, and 65% of Asians graduated. For the females slightly more than 50% of Latino females, 65% of African-Americans and Whites, and 75% of Asians successfully graduated.
- Two groups were identified as at-risk for dropping out. First was eighth-graders who attended school less than 80% of the time and failed an English and/or math course. Second was ninth graders who attended fewer than 70% of the days, earned fewer than 2 credits, and were not promoted to 10th grade on time. Gender, race, age, and test scores did not predict dropping out.

Roderick, M., Bryk, A. S., Jacob, B. A., Easton, J. Q., & Allensworth, E. (1999). *Ending social promotion: Results from the first two years.* Chicago, IL: Consortium on Chicago School Research.

- This report compared the experiences of students who attended Chicago Public Schools before and after a policy was enacted ending social promotion.
- The researchers found mixed and inconclusive results. More students met the benchmark cut off for promotion after social promotion was ended. However, students who were retained seemed to be doing worse than students who were socially promoted in previous years.

- The researchers noted multiple times the limited nature of the analysis, given it only compared two years.

Discussion

American Institutes for Research & Massachusetts Department of Elementary and Secondary Education (2014). *Early warning implementation guide: Using the Massachusetts Early Warning Indicator System (EWIS) and local data to identify, diagnose, support, and monitor students in grades 1-12.* Retrieved from http://www.doe.mass.edu/edwin/analytics/2014ImplementationGuide.pdf
- This was developed as a guide for schools in Massachusetts schools to use when using early warning data to identify, monitor, and support students in completing high school.
- Section 1 describes and defines the Massachusetts Early Warning Indicator System. Section 2 describes a six-step process for implementing an early warning system. Each step is described in terms of what it is, anticipated outcomes, and the tasks/processes for schools to consider when implementing the phase. Section 3 links to other useful online resources. Finally, section 4 is the appendices.

Balfanz, R. (2009). Can the american high school become an avenue of advancement for all? *The Future of Children*, *19*(1), 17-36.
- Arguing that a consensus is developing that high schools should prepare all students for postsecondary life, Balfanz discusses if schools can meet this goal and, if so, how they are doing.
- He begins by describing how schools continue to be largely divided among racial lines and the drastically different performance of students in predominantly white and predominantly minority schools.
- Balfanz then argues that reforms (e.g., standards, accountability) and investments (e.g., federal government) in low-performing schools over the past 25 years offer some hope. However, investments now need to be made in how to effectively scale the policies and practices that have proven effective.

Balfanz, R. (2011). Back on track to graduate. *Educational Leadership, 68*(7), 54-58.
- This article describes *The Diplomas Now* model, which is an intervention that was highly successful at improving attendance, behavior, and course failure issues that are so closely associated with dropping out.
- The *Diplomas Now* model is based on four elements. First is whole-school reform around instruction, teacher and administrator support, professional development, and organizational improvement to improve student achievement, promotion, and graduation rates.

- The second element is an Early Warning System that monitors student attendance, behavior, and course performance, highlighting students who fall off-track.
- The third element is strategically leveraging "near peers." Near peers are service corps members up to 24 years old who are trained at intervening with off-track students. Each near peer works with 15 approximately 15 students.
- The fourth and final element is team-based work. This involves investing resources in mission building, structuring schools for core teachers to share common students, and organizing schedules to allow core teaches time for collaboration.

Christenson, S. L., Reschly, A. L., Appleton, J. J., Berman-Young, S., Spanjers, D. M., & Varro, P. (2008). Best practices in fostering student engagement. In A. Thomas and J. Grimes (Eds.), *Best Practices in School Psychology V* (pp. 1099—1119). Washington, DC: National Association of School Psychologists.
- This chapter presents background information on student engagement followed by a list of evidence-based and promising practices for addressing student engagement.
- First the progression of the topic and application of student engagement is presented leading to the authors' conceptualization of the construct. The authors' definition of student engagement centers around four indicators including academic (e.g., time on task, grades), behavioral (e.g., attendance, suspensions), cognitive (e.g., processing academic information, self-regulation, perceived relevance of work), and psychological (e.g., identification with school, sense of belonging).
- Next, recommended practices are reviewed for each indicator. For instance, for academic engagement interventions related to improving instructional quality, supplemental supports, and classroom structures are described.

Fiester, L. (2010). *EARLY WARNING! Why reading by the end of third grade matters.* Baltimore, MD: The Annie E. Casey Foundation. Retrieved from: http://www.aecf.org/m/resourcedoc/AECF-Early_Warning_Full_Report-2010.pdf.
- This report describes the importance of proficient reading by third grade, factors contributing to low reading proficiency, and actions that can be taken for improvement.
- The authors begin by describing how reading proficiently by 3rd grade can be a make-or-break moment as they begin to shift from *learning to read* to *reading to learn*. Additionally, with a technologically advancing society, having a well-educated workforce is essential to sustained prosperity.
- Highlighted causes include, but are not limited to (a) lack of school readiness, (b) health concerns at birth, (c) opportunities for development prior to kindergarten,

(d) attending poor performing schools, and (e) children not having basic needs met.

- The authors recommend a comprehensive, coordinated approach with professionals from many sectors contributing to the solution. Recommendations include developing a comprehensive early childhood education system, involving parents, enacting results-driven initiatives to improve low-performing schools, and targeting absenteeism and summer regression.

Frazelle, S., & Barton, R. (2013) Implementing early warning systems. *Principal's Research Review, 8*(4), 1-7.

- This article offers guidance on how to develop and implement an early warning system. This includes four major steps, establishing a team, selecting and reporting accurate indicators, choosing relevant interventions given the selected indicators, and evaluating the system.
- Establishing a team involves: selecting members; defining roles and responsibilities; and selecting goals, objectives, and strategies. Professional development may be prerequisite before team members begin.
- Selecting and reporting on indicators consists of identifying and tracking a few, select indicators (e.g., absenteeism, behavioral incidents, course grades) and setting appropriate thresholds for when to intervene.
- When choosing relevant interventions the authors recommend compiling a list of interventions that are in place and then matching these to the appropriate indicators.
- Finally, evaluating the system should occur annually by reviewing student progress per each intervention.

Grady, M., & Bost, L. W. (Eds.). (2014). Decreasing dropout rates for minority male youth with disabilities from culturally and ethnically diverse backgrounds. Clemson, SC: National Dropout Prevention Center for Students with Disabilities.

This report lists specific strategies to decrease drop-out rates of African-American and Latino males with disabilities. These strategies include:

- Schools need early warning systems that serve to identify students once they show the first signs of school disengagement or problems.
- This system must be able to identify students who are at risk of school failure using a data-driven model in which school districts collect and analyze data related to academic success
- The available data must be understandable and useful for teachers and staff for early identification and intervention efforts
- Schools need strategies to re-engage students who are already off track

- School staff must be trained in interpreting the risk data and implementing the appropriate intervention and preventions strategies

Hamilton, L., Halverson, R., Jackson, S., Mandinach, E., Supovitz, J., & Wayman, J. (2009). *Using student achievement data to support instructional decision making* (NCEE 2009-4067). Washing, DC: National Center for Education Evaluation and Regional Assistance, Institute of Edcuation Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc/publications/practiceguides/.
- This guide was intended to support instructional decision making (e.g., adapting lessons and assignments to meet student needs, set goals and objectives, create groups) using student achievement data.
- This framework involves: (a) a data system that incorporates data from a variety of sources; (b) a data team that facilitates use and interpretation of data; (c) teachers discussing data use, interpretation, and student achievement; and (d) instructing students to use their personal data to set, monitor, and achieve personal educational goals.
- Finally, organizational and technological conditions that facilitate effective data use are described.

Heppen, J., & Therriault, S. B. (2008). *Developing early warning systems to identify potential high school dropouts*. Washington, DC: National High School Center at the American Institutes for Research. Retrieved from http://www.betterhighschools.org/docs/IssueBrief_EarlyWarningSystemsGuide.pdf
- This guide was intended to assist schools and districts to develop a system to collect data on early warning indicators to identify high risk students. It focuses specifically on (a) factors that contribute to dropping out, (b) research on early warning indicators, (c) step-by-step instructions on how schools can establish early warning systems, (d) information on how districts can establish early warning systems for the district, and (e) states' role in these processes.
- Factors identified are attendance and course performance. Regarding recommendations, readers are directed to resources at the national high school technical assistance center's website (formerly www.betterhighschools.org, now http://www.ccrscenter.org)

Hoff, N., Olson, A., & Peterson, R. L. (2015). *Dropout screening and early warning* [Topic brief]. Retrieved July 1, 2016, from Researchgate: https://www.researchgate.net/profile/Natalie_Hoff/publication/281111831_Dropout_Screening_Early_Warning/links/55d636b508aed6a199a4c610.pdf
- This report is divided into three sections. The first describes variables correlated with dropping out. The second describes how to create dropout screening procedures and tools, often called early warning systems. The final section provides examples of these procedures.

- Variables associated with dropout in the first section are the A-B-C dropout factors (i.e., attendance, behavior, course performance), demographic variables (i.e., race and ethnicity, socioeconomic status, disability status), and other (i.e., grade retention, school climate, engagement, mobility).
- In describing the components of developing a dropout screening program, the second section covers who to screen, variables to include, establishing cut points, and how to respond to high risk students.
- The final section reviews multiple dropout screening programs (i.e., the National High School Center Early Warning Intervention System, Michigan's Dropout Challenge, Dropout Early Warning System, School Disengagement Warning Index, National Dropout Prevention Center for Students with Disabilities Tools, NDPC-SD Student Risk Calculator, the on-track indicator).

MacIver, M. A., & MacIver, D. J. (2009). *Beyond the indicators: An integrated school-level approach to dropout prevention.* Arlington, VA: The George Washington University Center for Equity and Excellence in Education.
- This report describes (a) the research on the causes of dropping out, (b) how to create an integrated dropout prevention intervention, and (c) an effective pilot project.
- The causes of dropout are divided into two categories. Individual factors include the ABCs (i.e., absenteeism, behavior problems, course failure). Institutional factors include organizations, relationships, and practices.
- Integrated intervention incorporates three stages of prevention. Primary prevention involves district- and school-wide practices. Secondary prevention targets small groups of students. Tertiary prevention is focused on individual students.
- The pilot project involved two middle schools in Philadelphia that developed an effective system that incorporated data on early warning indicators, school staff team meetings, and the use of a "second team of adults" to assist with interventions.

MacIver, M. A., & MacIver, D. J. (2010). How do we ensure that everyone graduates? An integrated prevention and tiered intervention model for schools and districts. *New Directions for Youth Development, 2010*(127), 25-35.
- This article makes the case that the fragmented approach that is typical of dropout prevention is not appropriate for urban districts where more than half of students often do not receive diplomas. As such, the authors describe a systematic dropout prevention system for the district and school level.
- The primary, district, and school level of prevention consists of teachers providing high-quality instruction, a culture that promotes and personalized and orderly school environment, and strong connections with families.

- Secondary and tertiary levels are for students who do not respond to lower levels of intervention, so tertiary should be used after primary and secondary intervention have been applied. Comparisons to Response to Intervention and Positive Behavior Intervention and Supports are drawn.
- Last, the authors make recommendations for integrating an early warning system with tiered interventions. These include (a) regularly updated warning indicator data, (b) biweekly team meetings to discuss students with warning indicators and design interventions, and (c) having a second team of adults to assist with interventions that includes (e.g., public service corps, volunteers, social service professionals).

Therriault, S. B., O'Cummings, M., Heppen, J., Yerhot, L., & Scala, J. (2013). *High school early warning intervention monitoring system implementation guide.* National High School Center at the American Institutes for Research. Retrieved from http://www.earlywarningsystems.org/wp-content/uploads/documents/EWSHSImplementationguide2013.pdf

- This guide supports schools and districts that are implementing an early warning system (EWS), and was specifically written with the National High School Center's Early Warning System in mind (available at: http://www.earlywarningsystems.org/resources-tools/early-warning-system-high-school-tool/early-warning-system-high-school-tool-source-file-collators).
- The guide suggests using the early warning implementation monitoring system (EWIMS), which consists of the following seven steps: (1) establish roles and responsibilities, (2) use the EWS High School tool, (3) review EWS data, (4) interpret EWS data, (5) assign and provide interventions, (6) monitor students and interventions, and (7) evaluate and refine the EWIMS.

Reviews

Appleton, J. J., Christenson, S. L., & Furlong, M. J. (2008). Student engagement with school: Critical conceptual and methodological issues of the construct. *Psychology in the Schools, 45*, 369-386.

- This articles was designed to review how the term *student engagement* has been used by researchers.
- They begin by reviewing the existing literature on student engagement. Next, the authors describe the theoretical foundation of the various models of student engagement. They article ends with a discussion of the core principles needed to extend research on engagement.

Bruce, M., Bridgeland, J. M., Fox, J. H., & Balfanz, R. (2011). On track for success: The use of early warning indicator and intervention systems to build a grad nation. *Civic Enterprises*.

- This report looks at the use of early-warning systems across the nation and derives implications and recommendations from that analysis.
- The authors begin by reviewing the research on EWS describing the important indicators of dropping out (i.e., attendance, behavior, course performance) and the thresholds associated with them. The thresholds include (a) missing 20+ or more than 10% of school days, (b) 2+ behavior infractions, (c) reading below grade level at the end of 3rd grade, (d) failing English or math in grades 6-9, (e) GPA lower than 2.0, (f) 2+ failures in 9th grade, and (g) not being promoted to 10th grade on-time.
- In their review of implementation of EWS they identified three major lessons. These include: (a) vision and mission matter; (b) technical components must be strong; and (c) "resources must be assembled and maximized, fully engaging stakeholders to use data to guide implementation at the scale and intensity required" (p. 4).

Education Commission of the States. (2007). Dropout prevention. *The Progress of Education Reform 2007, 8*(1), 1-6.
- This report reviewed five studies that focused on dropout prevention. These were: (a) Balfanz, Herzog, and MacIver (2007); (b) Allensworth and Easton (2005); (c) Levin, Belfield, Muenning, and Rouse (2007); (d) Lee and Burkam (2003); and (e) Jerald (2006).
- Balfanz, Herzog, and MacIver (2007) were reported to have identified four indicators that students were at-risk for dropping out (i.e., failing English, failing math, attending school 80% or less, receiving one or more out-of-school suspensions) and five indicators affecting middle-school achievement (i.e., teacher support, teacher and peer expectations, parental involvement, student perception that math will be useful, intrinsic interest in math).
- Allensworth and Easton (2005) found students who met criteria to be "on-track" (i.e., achieving five or more full course credits and 1 or fewer failing semesters in a core subject in 9th grade) were more likely to graduate.
- Levin, Belfield, Muenning, and Rouse (2007) examined five initiatives and calculated the cost of those initiatives to the government compared to the benefits of increased high school completion. The factors looked at were the Perry Preschool Program, First Things First, reduction in class size for grades K-3, the Chicago child-parent center program, and a 10% increase in teacher salaries. The cost comparison resulted in a greater than 2:1 benefit to cost ratio. Each additional graduate resulted in a $209,000 benefit to the government in increased revenue and reduced costs, and the various programs cost $82,000 per student.
- Lee and Burkam (2003) identified four factors affecting dropout. These included math course-taking and achievement, math curriculum, school size, and student-teacher relationships.

- Jerald (2006) recommended schools and policy makers conduct localized longitudinal studies, use that data to develop an early warning system, and implement interventions that incorporate the following components: (a) tracking students from elementary through high school using student identification numbers; (b) accurate enrollment information including student entry and exit; (c) demographic data (e.g., eligibility for the federal free and reduced-price lunch program, race/ethnicity, gender, age); (d) transcript information (e.g., courses attempted, courses completed, grades, credits earned, grade retention); (e) attendance; (f) student behavior, grades, and discipline records; and (g) graduation and dropout.

Jerald, C. D. (2006). *Identifying potential dropouts: Key lessons for building an early warning data system* [White paper]. Retrieved June 28, 2016, from Achieve, Inc.: http://www.achieve.org/files/FINAL-dropouts_0.pdf

- This white paper was created for policy makers with the intent of providing an overview of research on causes of dropping out and methods of creating an early warning system.
- The authors identify three important lessons. First, students' experience in schools (e.g., academic performance, educational engagement) is the predominant factor in whether or not students drop out, *not* demographics or their home life. Second, it is possible to identify the majority of students who will drop out (e.g., early warning systems). Last, schools and educators can take productive steps to remedying the dropout crisis.

Kennelly, L., & Monrad, M. (2007). *Approaches to dropout prevention: Heeding early warning signs with appropriate interventions.* Washington, DC: National High School Center at the American Institutes for Research. Retrieved from http://files.eric.ed.gov/fulltext/ED499009.pdf

- The authors of this report reviewed the literature on dropout prevention using early warning systems. They summarized indicators of, and interventions to, prevent dropout.
- Key indicators identified were (a) poor grades in core subjects, (b) low attendance, (c) failure to be promoted to the next grade, and (d) disengagement in the classroom including behavioral problems.
- Effective interventions included following components:
  - Attendance and behavior monitors,
  - Tutoring and counseling,
  - Establishment of small learning communities for greater personalization,
  - Engaging catch-up courses,
  - Ninth Grade Academies,
  - Homerooms,
  - Benchmarking,
  - Progress monitoring,

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- Tiered interventions,
- Focus on equal access to rigorous coursework and high expectations,
- Career and college awareness,
- Community engagement, and
- Eighth-to-ninth grade transition programs.

Lyche, C. (2010), "Taking on the completion challenge: A literature review on policies to prevent dropout and early school leaving", OECD Education Working Papers, No. 53, OECD Publishing. http://dx.doi.org/10.1787/5km4m2t59cmr-en

- This paper provides a narrative literature review of dropout publications organized by (a) definitions of dropout, (b) causes of dropout, and (c) interventions to prevent dropout.
- Regarding definitions, the researchers used "dropout" and "early school leaving" as synonymous, both meaning not completing upper secondary education and training. This was used for both compulsory and non-compulsory secondary education programs.
- The causes of dropout were divided into three categories. First was individual and social factors, which consisted of educational performance (e.g., grades), behaviors and attitudes (e.g., engagement), and background (i.e., individuals, social). Second was school factors, which included school structure and resources (e.g., public/private, size, composition) and school practices (e.g., level of bureaucracy, relationship with teachers). Last was systemic factors, which were repeating a year, low course requirements, lack of apprenticeship places in apprenticeship systems.
- The final category reviewed was interventions to address dropout. Interventions were organized as targeting within school, outside school, and systemic factors. The most effective interventions targeted all three. The second most effective targeted factors outside of school.