

Stated Briefly

# Who will succeed and who will struggle? Predicting early college success with Indiana's Student Information System



Stated Briefly

**Elisabeth Davis**  
**Jennifer L. Stephan**  
**Jim Lindsay**  
**So Jung Park**

American Institutes for Research

In cooperation with the Midwest College and Career Success Alliance

---

This study examined the early college success of students who graduated from an Indiana high school in 2010 and enrolled immediately in a public two-year or four-year college in Indiana. The study team identified data elements in Indiana's Student Information System that predicted the early college success of this cohort of students. Half of Indiana high school graduates who enrolled in a public college in Indiana were successful, according to three indicators: enrolling in only nonremedial courses in the first semester, earning all attempted credits in the first semester, and continuing on to a second year of college. Early college success was predicted by student demographic and academic characteristics, type of college (two-year or four-year), level of academic preparation, and student behavior. Although several data elements were found to be statistically significant predictors, most of the variation in early college success across students remains unexplained.

---

This brief summarizes the findings of Stephan, J. L., Davis, E., Lindsay, J., & Miller, S. (2015). *Who will succeed and who will struggle? Predicting early college success with Indiana's Student Information System* (REL 2015-078). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Midwest. The report is available at <http://ies.ed.gov/ncee/edlabs/projects/project.asp?ProjectID=354>.

## **Why this study?**

Because economic growth and prosperity increasingly require a workforce with a postsecondary education (Carnevale, Smith, & Strohl, 2010), it is not surprising that college enrollment rates are on the rise. Between 2000 and 2012, college enrollment rates for high school completers improved from 63 percent to 67 percent (National Center for Education Statistics, 2015; Table 302.20). However, over the same period, college completion rates stagnated, with less than 60 percent of four-year college students and less than 35 percent of two-year college students attaining a postsecondary credential (National Center for Education Statistics, 2015; Table 326.10). Faced with this gap between college enrollment and completion, Indiana policymakers are seeking to better identify—and ultimately better prepare—students who may not be ready to succeed in college.

This brief summarizes the findings of a recent Regional Educational Laboratory Midwest study that investigated data elements in the state longitudinal data system that predict early college success.<sup>1</sup> This study supports Indiana's efforts and those of other states to identify and intervene with students at risk of not completing college. There is no widely accepted single indicator of early college success, but research provides evidence that college students who are successful on three commonly used indicators are more likely than those who were not successful on the indicators to complete college:

- Enrolling in only nonremedial courses in the first semester.
- Earning all attempted credits in the first semester.
- Continuing on to a second year of college.

Many students entering college are not academically prepared to complete college coursework and are placed in remedial courses. There is evidence that students who are placed in remedial courses are less likely than their peers who are not placed in remedial courses to complete college (Adelman, 2006; Attewell, Lavin, Domina, & Levey, 2006). This may be because remedial courses do not count for college credit, slowing down students' credit accumulation. Reducing placement into remedial education has become a priority for Indiana lawmakers. In May 2013, Governor Mike Pence signed into law HB 1005 requiring the Indiana State Board of Education to create guidelines for identifying high school students who may require remediation if they attend postsecondary education (Postsecondary and Workforce Training Program Remediation Education Act, 2013). In addition, Indiana is redesigning the remedial education system to reduce the number of college students placed in remedial education and increase their likelihood of success (Indiana Commission for Higher Education, 2013).

There is also evidence that college students who earn all attempted credits during the first semester are more likely to complete college. In one study, students who completed a higher ratio of earned-to-attempted credits in their first semester of college more often persisted to a second year (Nora, Barlow, and Crisp, 2005). In another, students who withdrew from or repeated 20 percent or more of courses during college were half as likely to earn a bachelor's degree (Adelman, 2006).

Finally, continuing on to a second year of college is a predictor of college completion. In national samples, students left college at higher rates in their first year than in later years (Bradburn, 2002; Horn, 1998). Although some college students who leave after one year eventually return to college, students who persist to a second year are more likely complete college within five years or still be enrolled than those who leave after one year (Horn, 1998).

The study team analyzed data on students who graduated from high school and attended college in Indiana to assess the relationship between student, high school, and college characteristics and the three indicators of early college success described above (see box 1 on data and methods). The study team also created a fourth indicator: a composite of all three indicators. Results from this study can help educators and policymakers

---

## Box 1. Data and methods

The Regional Educational Laboratory Midwest study team obtained student-level data from the Indiana Student Information System and data on Indiana's public colleges from the Integrated Postsecondary Education Data System and Barron's Profiles of American Colleges (Barron's Educational Series, 2010). The study sample consisted of students who graduated from an Indiana public or private high school in 2010 and enrolled in one of Indiana's 29 public colleges the following fall ( $N = 32,564$ ). Of the college enrollees, 30 percent entered a two-year college<sup>1</sup> and 70 percent entered a four-year college.

The study team first calculated descriptive statistics to determine what percentage of the study sample met indicators of college success. The study team also examined variation in early college success by race/ethnicity and school lunch program eligibility (a proxy for low-income status). Finally, the study team determined the extent to which 13 student, high school, and college characteristics predicted the three early college success indicators and the composite of all three indicators. When analyzing the relationship between each of the 13 characteristics and the indicators of college success, the study team adjusted for the potential influences of the other 12 characteristics. Separate results were produced for students who first entered a two-year college and those who first entered a four-year college.

### Note

1. For this study, two-year colleges were defined as colleges that have open enrollment and grant mostly two-year associate's degrees. In Indiana, these include Ivy Tech (a typical two-year college with more than 30 campuses located throughout the state) and Vincennes University (a four-year college that has open enrollment and grants primarily two-year associate's degrees).

---

better predict which students are likely to succeed in their early years of college and which students may require additional support. Providing this support may ultimately enable more students to complete college.

## What the study found

This study examined the early college success of Indiana high school students who graduated in 2010 and subsequently enrolled in one of Indiana's 29 public two-year or four-year colleges. Overall, findings suggest that the majority of students demonstrated early college success on a composite measure of whether students took only nonremedial courses in their first semester, earned all attempted credits in their first semester, and continued to a second year of college. However, the study found variation in early college success by student characteristics (race/ethnicity and school lunch program eligibility) and college characteristics (two-year versus four-year college). The study found that certain measures of academic preparation and student behavior in high school predict early college success, but much of the variation in college outcomes remains unexplained by the variables examined in the study.

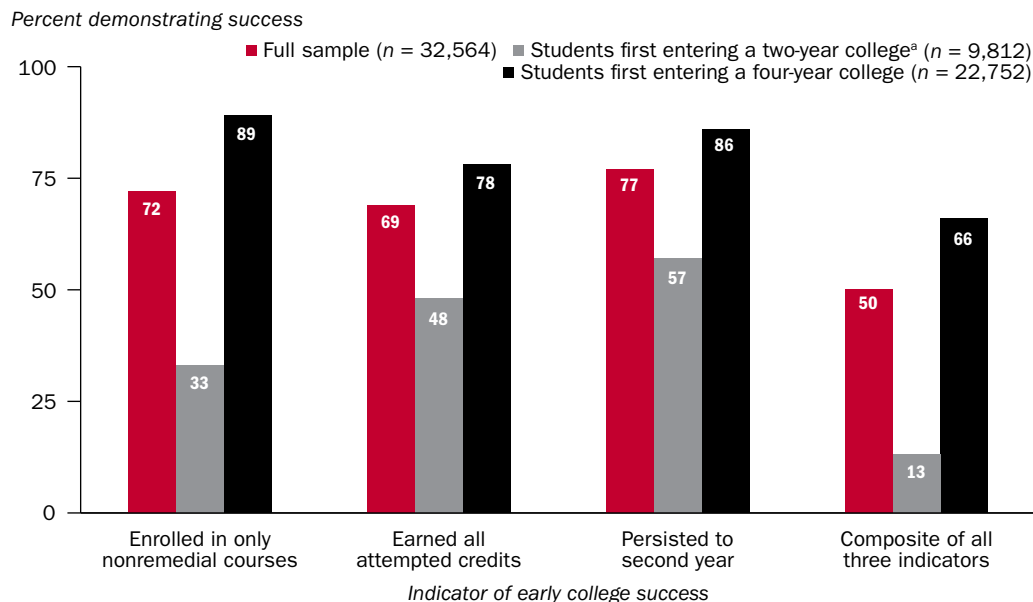
### Half of the college student sample demonstrated success on the composite of all three indicators of early college success

On the composite of all three indicators, 50 percent of students demonstrated early college success; students who first entered a two-year college were less likely to achieve success (13 percent) than students who first entered a four-year college (66 percent; figure 1).

### Low-income and Black college students demonstrated less early college success than their counterparts

Fifty-three percent of students first entering a two- or four-year college who were classified as White/other<sup>2</sup> demonstrated early success on the composite of all three indicators, compared with 26 percent of those who were classified as Black and 40 percent of those who were classified as Hispanic. The same patterns by race/ethnicity were found for the three separate indicators as well (figure 2).

**Figure 1. Students first entering a four-year college demonstrated more early college success than those first entering a two-year college, but success varied by indicator, 2010 freshmen**

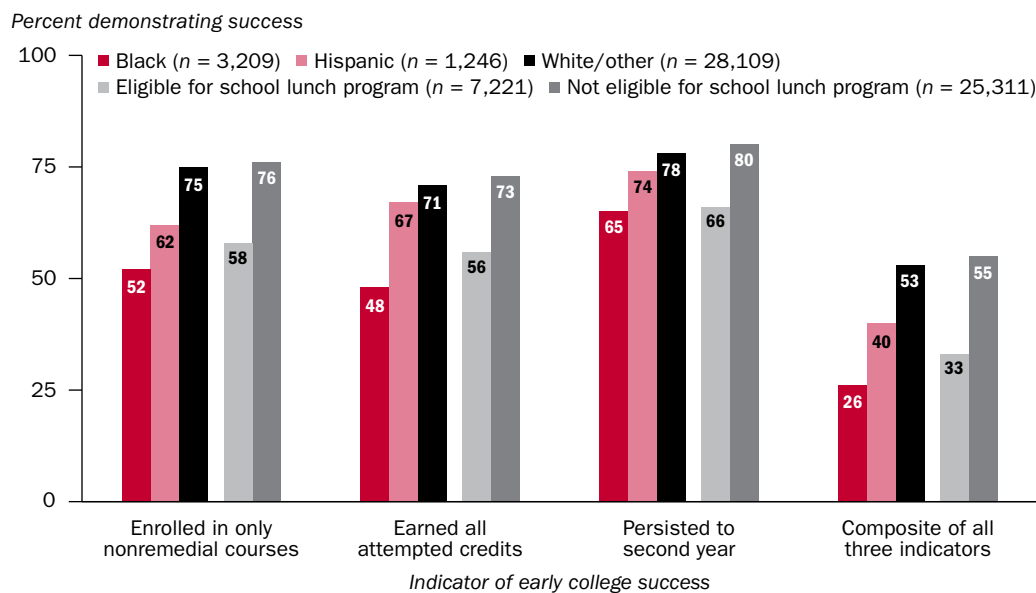


**Note:** Percentages are unadjusted and do not account for student, high school, or college characteristics.

**a.** Includes Vincennes University, a four-year college that has an open-admissions policy and that grants primarily associate's degrees.

**Source:** Authors' analysis based on data from the Indiana state longitudinal data system.

**Figure 2. Students achieving early college success varied by race/ethnicity and eligibility for the school lunch program in high school, all 2010 freshmen**



**Note:** Percentages are unadjusted and do not account for student, high school, or college characteristics. Students were grouped into three mutually exclusive categories based on race/ethnicity: White/other, Black, and Hispanic. Within the White/other category, 95 percent of students were White, 2 percent were Asian, 0.2 percent were American Indian/Alaskan Native, and 3 percent were two or more races/ethnicities. Data on student eligibility for the school lunch program were missing for 32 students.

**Source:** Authors' analysis based on data from the Indiana state longitudinal data system.

While the differences in early college success between Hispanic students and students classified as White/other were no longer clear after other demographic, academic, and behavioral characteristics were adjusted for, differences in early college success remained between Black students and students classified as White/other (table 1). After adjustment for other characteristics, the likelihood of early success on the composite of all three indicators among students entering a four-year college was 7 percentage points greater for White/other students than for Black students, and the likelihood of early success on the composite of all three indicators among students entering a two-year college was 4 percentage points greater for White/other students than for Black students.

Fifty-five percent of students first entering a two- or four-year college who were not eligible for the school lunch program in high school demonstrated early college success on the composite of all three indicators, compared with 33 percent of those eligible for the school lunch program (see figure 2). These differences remained after adjustment for other characteristics. The likelihood of early college success on the composite of all three indicators among students entering a four-year college was 6 percentage points greater for students who were not eligible for the school lunch program than for students who were eligible, and the likelihood of success on the composite of all three indicators among students entering a two-year college was 2 percentage points greater for students who were not eligible for the school lunch program than for students who were eligible.

### **Measures of academic preparation in high school are significant predictors of early college success**

Three measures of academic preparation in high school—Grade 10 Indiana State Test of Educational Proficiency Plus (ISTEP+) composite scores, earning at least one dual credit,<sup>3</sup> and taking at least one Advanced Placement (AP) exam—predicted all indicators of early college success for students first entering both two- and four-year colleges, after adjustment for other characteristics (see table 1).

Passing at least one AP exam also predicted all indicators of early college success for students first entering a four-year college after adjustment for other characteristics (see table 1). Passing at least one AP exam was not examined for students first entering a two-year college because too few passed an AP exam.

### **Student behavior in high school predicts some measures of early college success**

The number of student absences in high school predicted two indicators of early college success (earning all attempted credits in the first semester of college and continuing on to a second year of college) and the composite of all three indicators, after adjustment for other characteristics considered in these analyses. The number of absences did not predict enrollment in only nonremedial courses in the first semester for students in two- or four-year colleges (see table 1).

Students entering two-year colleges who took the ACT or SAT were more likely to demonstrate success on the three indicators of early college success as well as the composite of all three indicators than those entering two-year colleges who did not take the ACT or SAT, after adjustment for other characteristics considered in these analyses (see table 1). Taking the ACT or SAT was not a statistically significant predictor of early college success for students who enrolled in four-year colleges.

### **The high school characteristic was predictive of early college success, but college characteristics were not**

The percentage of a school's students passing an English I end-of-course exam (used here as a proxy measure for the average achievement of a student's high school) predicted success on nearly all indicators of early college success. It was not predictive of enrollment in only nonremedial courses in the first semester for students in four-year colleges, after adjustment for other characteristics considered in these analyses (see table 1).

**Table 1. Data elements from Indiana’s Student Information System that jointly predicted early college success for 2010 graduates of Indiana’s high schools who entered a two- or four-year college in fall 2010**

Characteristic	Entered a two year college				Entered a four year college			
	Enrolled in only nonremedial courses in the first semester	Earned all attempted credits in the first semester	Persisted to second year	Success on the composite of all three indicators	Enrolled in only nonremedial courses in the first semester	Earned all attempted credits in the first semester	Persisted to second year	Success on the composite of all three indicators
<i>Student demographics</i>								
Female	–***	+***	+***	–*	–*	+***	+***	+***
Black <sup>a</sup>	ns	–***	–***	–***	ns	–***	ns	–***
Hispanic	ns	ns	ns	<b>ns</b>	ns	ns	ns	<b>ns</b>
Eligible for school lunch program	ns	–*	–***	–*	ns	–***	–***	–***
<i>Student academic achievement</i>								
Grade 10 ISTEP+ composite	+***	+**	+**	+***	+**	+**	+**	+***
Earned at least one dual credit <sup>b</sup>	+***	+***	+***	+***	+***	+***	+***	+***
Took at least one Advanced Placement exam	+***	+***	+**	+***	+***	+***	+**	+***
Passed at least one Advanced Placement exam <sup>c</sup>	ne	ne	ne	<b>ne</b>	+***	+***	+**	+***
<i>Student behaviors</i>								
Absent 15–30 days <sup>d</sup>	ns	–***	–***	–**	ns	–***	–***	–***
Absent 31 days or more <sup>d</sup>	ns	–***	–***	–***	ns	–***	–***	–***
Took ACT or SAT	+***	+***	+***	+***	ns	ns	ns	<b>ns</b>
<i>High school characteristic</i>								
Percentage of students passing English I exam	+***	+***	+***	+***	ns	+***	+***	+***
<i>College characteristics</i>								
Vincennes University <sup>e</sup>	ns	+**	ns	+**	ne	ne	ne	<b>ne</b>
More competitive four-year college <sup>f</sup>	ne	ne	ne	<b>ne</b>	ns	ns	ns	<b>ns</b>
Less competitive four-year college <sup>f</sup>	ne	ne	ne	<b>ne</b>	ns	ns	ns	<b>ns</b>
Percentage of variance explained	35	7	8	<b>31</b>	25	19	22	<b>26</b>

\* Significant at  $p < .05$ ; \*\* significant at  $p < .01$ ; \*\*\* significant at  $p < .001$ ; + positive relationship; – negative relationship.

ne is not evaluated; ns is no statistical relationship. ISTEP+ is Indiana State Test of Educational Proficiency Plus (Indiana’s accountability test).

**Note:** Dark red cells indicate a positive statistical relationship; light red cells indicate a negative statistical relationship; grey cells indicate no statistical relationship. Results for success on the composite of all three indicators are bolded to highlight these key findings.

**a.** Students were grouped into three racial/ethnic categories: White/other, Black, and Hispanic. White/other was the reference category.

**b.** Refers to coursework taken in high school that carries both high school and college credit.

**c.** Few students first entering a two-year college passed an Advanced Placement exam. Therefore this predictor was not included in statistical models.

**d.** Absences were based on the sum of absences between 2006/07 and 2009/10. Comparison was with fewer than 15 absences.

**e.** Vincennes University is a four-year college that has an open-admissions policy and that grants primarily associate’s degrees. For this study, Vincennes was categorized as a two-year college.

**f.** Based on Barron’s classification according to SAT or ACT scores, class rank, and high school grade point average of students enrolled in the college and the percentage of applicants accepted (Barron’s Educational Series, 2010). This study defines less competitive colleges as those in Barron’s less competitive and noncompetitive categories, competitive colleges as those in Barron’s competitive category, and more competitive colleges as those in Barron’s very, highly, and most competitive categories.

**Source:** Authors’ analysis based on data from the Indiana state longitudinal data system.

College competitiveness did not predict early college success among students first entering a four-year college, after adjustment for other characteristics considered in these analyses (see table 1).

### **Most of the variation in college success across students remains unexplained**

Overall, the student, high school, and college characteristics analyzed explained 35 percent or less of the variation in students' early college success.<sup>4</sup>

### **Implications of the study**

The results raise three considerations for educators and policymakers.

First, educators and policymakers may want to direct additional resources to low-income and Black students. Even after adjustments for other student, high school, and college characteristics, significant gaps in early college success remained between Black and White/other students as well as between students who were eligible for the school lunch program and those who were not eligible.

Second, educators and policymakers may want to use multiple student, high school, and college characteristics to predict early college success. Students' scores on the grade 10 Indiana state standardized test were significant predictors of early college success, and two-year colleges in Indiana have traditionally relied upon test scores for placing students into remedial courses. However, other measures of academic achievement (for example, dual credit enrollment, AP course- and exam-taking) and student behavior (for example, absences, taking the ACT or SAT) may also explain variation in early college success, even after adjustment for all other characteristics considered in this study. Thus, examining multiple predictors of early college success may more fully describe students' probability of success during their first two years of college. In addition, student, high school, and college characteristics did not all predict the same indicators of early college success. For example, student absences did not predict enrollment in only nonremedial courses in the first semester, while it did predict the other two early college success indicators and the composite of all three indicators.

Finally, educators and policymakers should use caution in interpreting the significance of the predictors of early college success. Although this analysis included most of the data elements available in Indiana's state longitudinal data (and shown in prior research to predict postsecondary achievements), the examined predictors explained 35 percent or less of the variation in early college success. Additional data elements not currently captured by state data (for example, social or emotional characteristics) might explain additional variation, but this is only speculative and would require future research. Moreover, the analyses presented are correlational, so causal inferences cannot be drawn. Although the identified data elements predict early college success, improving student performance on them would not necessarily lead to increases in early college success because students who perform well on the predictors may be more likely to achieve early college success anyway. However, this study identifies some data elements that may help high schools distinguish students who are likely to succeed in college from students who are likely to struggle in college, to whom high schools can then provide additional resources.

## **Notes**

---

1. Early college success refers to success in the first few years of college following high school graduation. The term does not refer to high school students enrolled in college coursework prior to graduation from high school.
2. Students were grouped into three mutually exclusive categories based on race/ethnicity: White/other, Black, and Hispanic. Within the White/other category, 95 percent of students were White, 2 percent were Asian, 0.2 percent were American Indian/Alaskan Native, and 3 percent were two or more races/ethnicities.
3. Dual credit refers to coursework taken in high school that carries both high school and college credit.
4. The method used to calculate percentage of variance explained is described in the full report.



## References

- Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college*. Washington, DC: U.S. Department of Education. <http://eric.ed.gov/?id=ED490195>
- Attewell, P., Lavin, D., Domina, T., & Levey, T. (2006). New evidence on college remediation. *Journal of Higher Education*, 77(5), 886–924. Retrieved March 30, 2015, from <http://knowledgecenter.completionbydesign.org/sites/default/files/16%20Attewell%20JHE%20final%202006.pdf>.
- Barron's Educational Series. (2010). *Barron's profiles of American colleges 2011* (29th edition). Hauppauge, NY: Author.
- Bradburn, E. M. (2002). *Short-term enrollment in postsecondary education: Student background and institutional differences in reasons for early departure, 1996–98* (NCES No. 2003–153). National Center for Education Statistics Working Paper. Washington, DC: U.S. Department of Education. <http://eric.ed.gov/?id=ED470227>
- Carnevale, A., Smith, N., & Strohl, J. (2010). *Help wanted: Projections of jobs and education requirements through 2018*. Washington, DC: Georgetown University Center on Education and the Workforce. <http://eric.ed.gov/?id=ED524310>
- Horn, L. J. (1998). *Stopouts or stayouts? Undergraduates who leave college in their first year* (NCES No. 1999–087). National Center for Education Statistics Working Paper. Washington, DC: U.S. Department of Education. <http://eric.ed.gov/?id=ED425683>
- Indiana Commission for Higher Education. (2013). Resolution to redesign remediation in Indiana. Retrieved March 31, 2015, from [http://www.in.gov/che/files/Resolution\\_-\\_Remediation\\_Redesign\\_-\\_May\\_9\\_2013\\_%28FINAL%29.pdf](http://www.in.gov/che/files/Resolution_-_Remediation_Redesign_-_May_9_2013_%28FINAL%29.pdf).
- National Center for Education Statistics. (2015). *Digest of education statistics 2013*. Washington, DC: U.S. Department of Education, Institute of Education Sciences. <http://eric.ed.gov/?id=ED556349>
- Nora, A., Barlow, E., & Crisp, G. (2005). Student persistence and degree attainment beyond the first year in college. In A. Seidman (Ed.), *College student retention: Formula for student success* (pp. 129–153). Westport, CT: Greenwood.
- Postsecondary and Workforce Training Program Remediation Education Act. Indiana Code 20–32–9. (2013). Retrieved March 30, 2015, from <http://iga.in.gov/legislative/laws/2014/ic/titles/020/articles/032/chapters/009>.

REL 2016–126

The National Center for Education Evaluation and Regional Assistance (NCEE) conducts unbiased large-scale evaluations of education programs and practices supported by federal funds, provides research-based technical assistance to educators and policymakers, and supports the synthesis and the widespread dissemination of the results of research and evaluation throughout the United States.

February 2016

This report was prepared for the Institute of Education Sciences (IES) under Contract ED-IES-12-C-0004 by Regional Educational Laboratory (REL) Midwest administered by American Institutes for Research. The content of the publication does not necessarily reflect the views or policies of IES or the U.S. Department of Education nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

This REL report is in the public domain. Although permission to reprint this publication is not necessary, it should be cited as:

Davis, E., Stephan, J. L., Lindsay, J., & Park, S. J. (2016). *Stated Briefly: Who will succeed and who will struggle? Predicting early college success with Indiana's Student Information System* (REL 2016–126). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Midwest. <http://ies.ed.gov/ncee/edlabs>.

This report is available on the REL website at <http://ies.ed.gov/ncee/edlabs>.

## The Regional Educational Laboratory Program produces 7 types of reports

	<b>Making Connections</b> Studies of correlational relationships
	<b>Making an Impact</b> Studies of cause and effect
	<b>What's Happening</b> Descriptions of policies, programs, implementation status, or data trends
	<b>What's Known</b> Summaries of previous research
	<b>Stated Briefly</b> Summaries of research findings for specific audiences
	<b>Applied Research Methods</b> Research methods for educational settings
	<b>Tools</b> Help for planning, gathering, analyzing, or reporting data or research