IES Institute of Education Sciences

STUDY BRIEF
June 2021

Regional Educational Laboratory Midwest
At American Institutes for Research

Indiana and Minnesota Students Who Focused on Career and Technical Education in High School: Who Are They, and What Are Their College and Employment Outcomes?

In Indiana and Minnesota the state education agency, state higher education agency, and the state workforce agency have collaborated to develop career and technical education courses intended to improve high school students' college and career readiness. These agencies partnered with the Regional Educational Laboratory Midwest to examine whether high school graduates in each state who completed a large number of career and technical education courses in a single career-oriented program of study (concentrators) had different college and workforce outcomes from graduates who completed fewer (samplers) or no career and technical education courses (nonparticipants). The study found that in the 2012/13–2017/18 graduation cohorts, male graduates were more likely to be concentrators than female graduates, and graduates who received special education services were more likely to be concentrators than those who did not receive services. Graduates who were not proficient in reading in grade 8 also were more likely to become concentrators than those who were proficient. Graduates who attended urban and suburban schools were more likely than students who attended town and rural schools to be nonparticipants. Concentrators were less likely than samplers and nonparticipants with similar characteristics to enroll in college, but the differences reflect mainly enrollment in four-year colleges. Concentrators were more likely to enroll in two-year colleges. Concentrators also were less likely than similar samplers and nonparticipants to complete a bachelor's degree within four to six years. Finally, compared with similar samplers and nonparticipants, concentrators were employed at higher rates in the first five years after high school and had higher earnings.

Why this study?

In Indiana and Minnesota, career and technical education programs are intended to provide pathways to both postsecondary education and careers after high school. Each state's education agency, higher education agency, and workforce agency have collaborated to develop career and technical education courses and sequences of courses intended to improve high school students' college and career readiness.

The agencies in both states partnered with the Regional Educational Laboratory Midwest to study those efforts. They wanted to know whether the background characteristics of high school graduates and their schools were associated with completion of career and technical education courses. The agencies also wanted to know whether graduates who completed a large number of career and technical education courses in a single career-oriented program of study (concentrators) have different rates of college enrollment and certificate or degree attainment, different employment rates, and different earnings five years after high school graduation from graduates from the same high school and with similar characteristics who completed fewer (samplers) or no career and technical education courses (nonparticipants). The findings from the study suggest opportunities to expand participation in career and technical education for certain types of students and schools and provide useful information on the benefits and drawbacks of participation in career and technical education.

What was studied and how?

The study team conducted state-specific analyses of data for high school graduates in Indiana and Minnesota to address four research questions:

1. What percentage of high school graduates in each state were career and technical education concentrators, explorers, samplers, and nonparticipants?[1]

2. What background characteristics of high school graduates and their high schools are associated with being a career and technical education concentrator in each state?

3. How does being a career and technical education concentrator affect high school graduates' college enrollment and degree attainment in each state?

4. How does being a career and technical education concentrator affect high school graduates' employment and earnings in each state?

Data and methods

The study used K–12 education data, postsecondary education data, and employment data for all graduates from public high schools in Indiana from 2013/14 to 2017/18 and public high schools in Minnesota from 2012/13 to 2017/18. Graduates' secondary education data were linked to their postsecondary education records and to their employment and earnings records. The study team used graduates' course completion data to classify them into career and technical education participation groups. To address research question 1, the study team calculated the percentages of graduates who met their state's definition of concentrator, explorer, sampler, and nonparticipant. To address research question 2, the team cross-tabulated graduates' characteristics and the characteristics of their high schools with their career and technical education classification. To address research questions 3 and 4, the study team first used a statistical matching procedure to match concentrators with similar samplers and nonparticipants in the same cohort and school. The study team then used regression models to compare the concentrators with similar samplers and nonparticipants on their college outcomes, employment rates, and annual earnings, while adjusting for the background characteristics of graduates and their high schools. The analysis was conducted separately for each state using the same methods. Because the contexts for career and technical education, postsecondary education, and employment were different in the two states, findings for the two states are not directly comparable.

Findings

About 21 percent of graduates in Indiana and 44 percent in Minnesota were career and technical education concentrators

- In Indiana 21 percent of graduates were concentrators, 8 percent were explorers, 48 percent were samplers, and 22 percent were nonparticipants.
- In Minnesota, which defines concentrators more broadly than Indiana, 44 percent of graduates were concentrators, 15 percent were explorers, 24 percent were samplers, and 17 percent were nonparticipants.

1. In both states concentrators completed a large number of career and technical education courses in a single topic area, explorers completed a large number of such courses in multiple topic areas, samplers completed just one or two such courses, and nonparticipants completed no such courses. In Indiana, concentrators attained six or more semester credits (roughly equivalent to three years of courses) in a single career and technical education pathway (Indiana currently offers 64 pathways across 12 career clusters). In Minnesota, concentrators completed at least 150 hours of instruction (roughly equivalent to a full-year course that meets 51 minutes a day, five days per week) in a single career and technical education career field (Minnesota currently offers 79 career pathways across 16 career clusters and six career fields). The typologies of career fields, clusters, and pathways for each state are provided in appendix A of the main report.

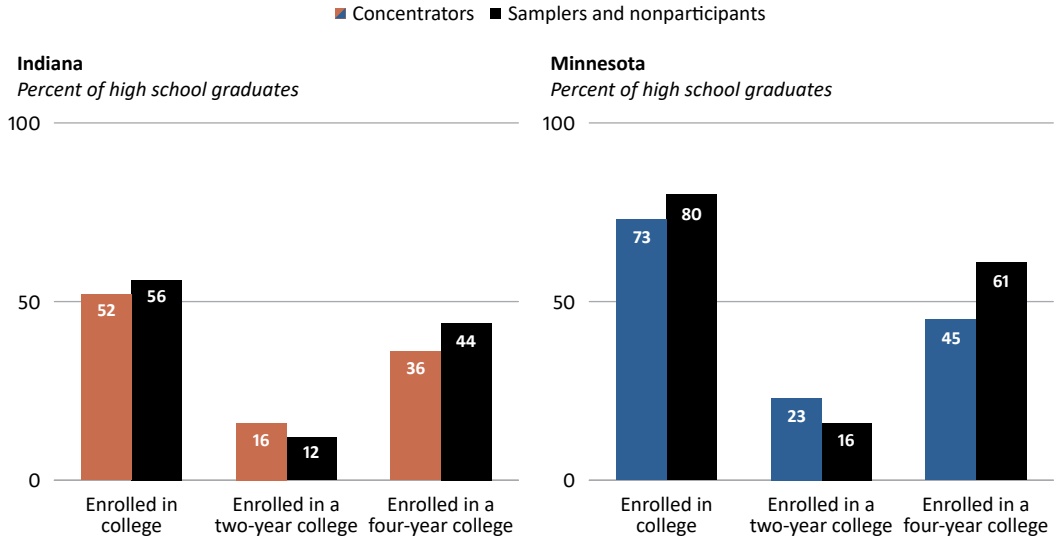
In both states graduates who were male, graduates who received special education services, and graduates who were not proficient in reading were more likely to be concentrators, and graduates who attended schools in urban and suburban areas were more likely to be nonparticipants

- Male graduates were 6–9 percentage points more likely to be concentrators than female graduates.
- Graduates who received special education services were 6–7 percentage points more likely to be concentrators than graduates who did not receive special education services.
- Graduates who were not proficient in reading in grade 8 were 10–11 percentage points more likely to be concentrators than graduates who were proficient.
- In both states graduates who attended urban and suburban schools were 7–18 percentage points more likely to be nonparticipants than graduates in town and rural schools.

After other factors were adjusted for, Indiana and Minnesota concentrators had lower college enrollment rates than similar samplers and nonparticipants, and concentrators were more likely to enroll in a two-year college but less likely to enroll in a four-year college

- After characteristics of graduates and their high schools were adjusted for, concentrators in both states enrolled in any type of college within one year of high school graduation at a rate 4–7 percentage points below that of similar samplers and nonparticipants. However, the lower rates among concentrators were evident only for four-year colleges, where they enrolled at a rate 8–16 percentage points below that of similar samplers and nonparticipants. The enrollment rate in a two-year college was 4–7 percentage points higher for concentrators than for similar samplers and nonparticipants (figure 1).
- Concentrators earned fewer credits in the first year of college than similar samplers and nonparticipants.
- In both states concentrators were 5–12 percentage points less likely to attain a bachelor's degree than similar samplers and nonparticipants, and concentrators were 1–2 percentage points more likely to attain an associate's degree than similar samplers and nonparticipants. In Minnesota, concentrators were 2 percentage points more likely to attain a certificate than similar samplers and nonparticipants.

Figure 1. Indiana and Minnesota career and technical education concentrators were more likely than similar samplers and nonparticipants to enroll in two-year colleges within one year of graduation but less likely to enroll in four-year colleges, 2012/13–2017/18 cohorts



Note: *n* = 135,090 high school graduates for Indiana and 171,778 graduates for Minnesota. All differences between concentrators and the comparison group (samplers and nonparticipants) are statistically significant at the .001 level. Percentages were generated using regression models that adjusted for the background characteristics of graduates and their high schools. Estimates for Indiana are based on cohorts of graduates from 2013/14 to 2017/18. Estimates for Minnesota are based on cohorts of graduates from 2012/13 to 2017/18. College enrollment rates are based on all years of data available for each cohort of high school graduates.

Source: Authors' analysis of data provided by the Indiana Performance Management Hub and the Minnesota Statewide Longitudinal Education Data System.

After other factors were adjusted for, concentrators in both states had higher employment rates and higher annual earnings after high school graduation than similar samplers and nonparticipants

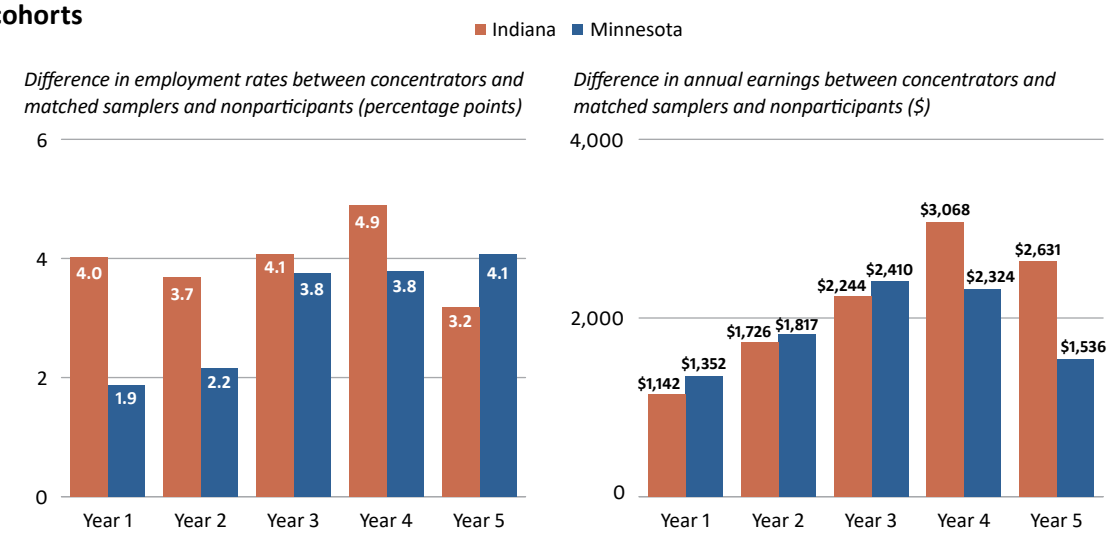
- In both states employment rates during the first five years after high school graduation were 2–5 percentage points higher for concentrators than for similar samplers and nonparticipants (figure 2).
- In both states annual earnings during the first five years after high school graduation were $1,142–$3,068 higher for concentrators than for similar samplers and nonparticipants (see figure 2).

Implications

High school educators and guidance counselors can use these findings to inform students' selection of courses. High school students who are considering taking career and technical education courses that align with their career aspirations might want to know the college enrollment, college completion, employment, and earnings outcomes among students who have made similar choices. Despite the differences between concentrators and similar samplers and nonparticipants, the study findings do not suggest that concentrating in a career and technical education field precludes students from enrolling in a two-year or four-year college, attaining a degree, or becoming employed. Many concentrators are still able to enroll and succeed in a four-year college, and many samplers and nonparticipants are able to obtain employment and accrue earnings during the years immediately following high school graduation.

State education agency staff might want to explore the reasons for the associations between student and high school characteristics and students' decisions to become a career and technical education concentrator. The associations might reflect differences in workforce needs in different parts of each state, differences in interests among different types of students, differences in student access to career and technical education courses, or some combination of these factors. If the associations reflect differential access to in-demand courses, the relevant state agencies might want to help career and technical education course providers expand their offerings to include the in-demand courses or expand eligibility requirements so that students in neighboring districts can enroll in their courses.

Figure 2. Career and technical education concentrators in Indiana and Minnesota had higher annual earnings during the first five years after high school graduation than similar samplers and nonparticipants, 2012/13–2017/18 cohorts



Note: For Indiana *n* = 135,090 high school graduates for year 1, 106,692 for year 2, 73,626 for year 3, 44,938 for year 4, and 20,678 for year 5. For Minnesota *n* = 171,778 graduates for year 1, 142,726 for year 2, 114,126 for year 3, 85,076 for year 4, and 55,438 for year 5. Employment rates and annual earnings were generated using regression models that adjusted for the background characteristics of graduates and their high schools. Positive differences favor concentrators. Employment information was not available for high school graduates who were employed outside the state, who were self-employed, who entered military service, or whose employer did not report wages to the state (including employees of the federal government), so it was not possible to distinguish them from unemployed high school graduates. They were treated as unemployed in these analyses. Earnings for graduates designated as unemployed are $0. Annual earnings were converted to 2013 dollar values using inflation calculations based on the Consumer Price Index for All Urban Consumers, Midwest Region.

Source: Authors' analysis of data provided by the Indiana Performance Management Hub and the Minnesota Statewide Longitudinal Education Data System.

This brief was prepared for the Institute of Education Sciences (IES) under Contract ED-IES-17-C-0007 by the Regional Educational Laboratory Midwest administered by the 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. The full report is available on the Regional Educational Laboratory website at http://ies.ed.gov/ncee/edlabs.

Lindsay, J., Austin, M., Wan, Y., Pan, J., Pardo, M., & Yang, J. H. (2021). *Indiana and Minnesota students who focused on career and technical education in high school: Who are they, and what are their college and employment outcomes?* (REL 2021–090). 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.