What's Happening

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The postsecondary education and employment pathways of Minnesota public high school graduates: Investigating opportunity gaps

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Key findings

This study examines the postsecondary education and employment pathways of Minnesota public high school graduates one year after graduation and their college certificate and degree attainment and employment outcomes six years after graduation.

- Within one year of graduation, 92 percent of graduates were enrolled in college or employed. Initial postsecondary pathways varied by student characteristics but not by high school rurality.
- Within one year of graduation, graduates with disabilities, graduates with limited English proficiency, Hispanic graduates, and American Indian/Alaska Native graduates were the most likely to be neither employed nor enrolled in college.
- Six years after graduation, 48 percent of graduates had not attained a college certificate or degree, 37 percent had attained a bachelor's degree or higher, 11 percent had attained an associate's degree, and 4 percent had attained a college certificate.
- Six years after graduation, 71 percent of graduates were employed, and their median annual earnings were $22,717.
- Six years after graduation, there were differences in college certificate and degree attainment, employment, and median annual earnings by student characteristics, even among graduates who followed the same initial postsecondary pathway.

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This report is available on the Regional Educational Laboratory website at http://ies.ed.gov/ncee/edlabs.

Summary

This report examines the postsecondary education and employment pathways of Minnesota public high school graduates one year after graduation and their college certificate and degree attainment and employment outcomes six years after graduation. Minnesota's World's Best Workforce legislation, passed in 2013, calls for all students in the state to receive a high-quality education that prepares them for success in the workforce (Minnesota Department of Education, 2014). The legislation requires districts to create a plan to meet five goals, including that all students leave high school ready for college and career.

Through this legislation, Minnesota aims to create a more competitive workforce and prepare its future leaders for employment. However, in Minnesota, as in many other states, not all students have access to the types and quality of education experiences in high school that are likely to lead to high-paying jobs. Studies have found that male students, racial/ethnic minority students, economically disadvantaged students, students with limited English proficiency, students with disabilities, and students who live in rural communities are less likely than their counterparts to leave high school ready for careers and college (see appendix A).

To be well positioned to reduce achievement gaps that lead to different college and career outcomes, Minnesota education policymakers and practitioners must have reliable data on the postsecondary pathways of Minnesota public high school graduates, as well as information on differences in pathways and outcomes across groups of students. The REL Midwest Career Readiness Research Alliance requested this study to better understand the postsecondary pathways of Minnesota public high school graduates and to gain insight into opportunity gaps among those graduates. Alliance members expect to use the findings to direct interventions to specific student populations to increase postsecondary persistence and success in the workforce.

The study analyzed data from the Minnesota Statewide Longitudinal Education Data System, provided by the Minnesota Office of Higher Education, on the initial postsecondary pathways of Minnesota public high school students who graduated between 2008 and 2015. The study also examined the college certificate and degree attainment and employment outcomes six years later of Minnesota public high school students who graduated between 2008 and 2010. Key findings include:

- Within one year of graduation, 92 percent of graduates were enrolled in college or employed. Initial postsecondary pathways varied by student characteristics but not by high school rurality.
- Within one year of graduation, graduates with disabilities, graduates with limited English proficiency, Hispanic graduates, and American Indian/Alaska Native graduates were the most likely to be neither employed nor enrolled in college.
- Six years after graduation, 48 percent of graduates had not attained a college certificate or degree, 37 percent had attained a bachelor's degree or higher, 11 percent had attained an associate's degree, and 4 percent had attained a college certificate.
- Six years after graduation, 71 percent of graduates were employed, and their median annual earnings were $22,717.
- Six years after graduation, there were differences in college certificate and degree attainment, employment, and median annual earnings by student characteristics, even among graduates who followed the same initial postsecondary pathway.

The results of this study suggest several considerations for policymakers and practitioners in Minnesota. First, high schools might consider expanding access to college readiness opportunities such as college preparation courses and college counseling for racial/ethnic minority students, economically disadvantaged students, students with limited English proficiency, and students with disabilities. Second, high schools might consider directing more intensive resources such as early college and career planning to students who are most at risk during the transition to postsecondary education and employment, including graduates with disabilities, graduates with limited English proficiency, Hispanic graduates, and American Indian/Alaska Native graduates. Third, high schools could share information with students about the earnings of past cohorts of students and about how earnings differed across postsecondary pathways. Finally, colleges might consider opportunities to better support these students while they are in college.

Contents

Boxes

Figures

Tables

Why this study?

Completing high school signals the start of a new journey for many young people. Within a year of high school graduation, most graduates will register for a postsecondary certification or training program, enroll in a less-than-four-year or four-year postsecondary institution, enter the workforce, enlist in the military, or begin another endeavor. Over the past several decades it has become increasingly important for high school graduates to pursue postsecondary training and education. The shift from a manufacturing economy to a knowledge-driven economy has meant that employers need better educated workers with expertise in handling complex tasks that is transferable across industries (Carnevale, Smith, & Strohl, 2013). Increased demand for workers with such skills has led to rising wages for those workers in recent decades (Carnevale et al., 2013).

Minnesota's World's Best Workforce legislation, passed in 2013, calls for all students in the state to receive a high-quality education that prepares them for success in the workforce (Minnesota Department of Education, 2014). The legislation requires districts to create a plan to meet five goals, including that all students leave high school ready for college and career.

Through this legislation, Minnesota aims to create a more competitive workforce and prepare its future leaders for employment. However, in Minnesota, as in many other states, not all students have access to the types and quality of education experiences in high school that are likely to lead to high-paying jobs. Studies have found that male students, racial/ethnic minority students, economically disadvantaged students, students with limited English proficiency, students with disabilities, and students who live in rural communities are less likely than their counterparts to leave high school ready for careers and college (see appendix A).

To be well positioned to reduce opportunity gaps that lead to different college and career outcomes, Minnesota policymakers and practitioners must have reliable data on the postsecondary pathways of Minnesota public high school graduates, as well as information on differences in pathways and outcomes across groups of students. The REL Midwest Career Readiness Research Alliance requested this study to better understand the postsecondary pathways of Minnesota public high school graduates and to gain insight into opportunity gaps among those graduates. Alliance members expect to use the findings from this study to direct interventions to specific student populations to increase postsecondary persistence and success in the workforce.

This study analyzed data from the Minnesota Statewide Longitudinal Education Data System, provided by the Minnesota Office of Higher Education. The study examined the initial postsecondary pathways of 2008–15 Minnesota public high school students within one year of graduation (see box 1 on initial postsecondary pathways). The study also examined the college certificate and degree attainment and employment outcomes of 2008–10 graduates six years after graduation. The study's results are expected to provide a foundation for the development of a longer term research agenda focused on the college and career readiness of Minnesota public high school graduates.

Box 1. Defining initial postsecondary pathways within one year of graduation

The study examined the initial postsecondary pathways that 2008–15 Minnesota public high school graduates followed within one year following high school graduation. Six initial postsecondary pathways were considered:

1. Employed, no college: graduates who were employed but not enrolled in college.
2. Less-than-four-year college only: graduates who enrolled in a less-than-four-year college but were not employed. (Less-than-four-year colleges include colleges that grant certificates and associate's degrees.)
3. Four-year college only: graduates who enrolled in a four-year college but were not employed.
4. Less-than-four-year college, employed: graduates who enrolled in a less-than-four-year college and were employed, either full or part time.
5. Four-year college, employed: graduates who enrolled in a four-year college and were employed, either full or part time.
6. Not employed, no college: graduates who were not employed and were not enrolled in college. Due to data limitations, this category also includes graduates who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by employers that did not report wages to the state of Minnesota.

For the analyses of college certificate and degree attainment and employment outcomes, pathways 2 and 4 were collapsed into a single pathway, *less-than-four-year college,* and pathways 3 and 5 were collapsed into a single pathway, *four-year college.*

For more information about the data used to construct these pathways, see box 2 and appendix B.

What the study examined

The study explored three research questions:

1. What percentage of 2008–15 Minnesota public high school graduates transitioned from high school to employment, college, or a combination of employment and college within one year of high school graduation?

2. What was the highest college certificate or degree attained by 2008–10 Minnesota public high school graduates six years after high school graduation?

3. What percentage of 2008–10 Minnesota public high school graduates were employed six years after high school graduation? What were their annual earnings?

The findings from the first research question, focused on students' initial postsecondary pathways, were disaggregated by the rurality of students' high schools and by student gender, race/ethnicity, socioeconomic status, English proficiency, and disability status. The findings from the second research question, focused on college certificate and degree attainment, and the third research question, focused on employment and annual earnings, were disaggregated by initial postsecondary pathway, by the rurality of students' high schools, and by student gender, race/ethnicity, socioeconomic status, English proficiency, and disability status. For the second and third research questions, differences in attainment, employment, and earnings by high school rurality and by student gender, race/ethnicity, socioeconomic

status, English proficiency, and disability status were examined for students who followed the same initial postsecondary pathway.

The study used data from the Minnesota Statewide Longitudinal Education Data System, which is maintained by the Minnesota Office of Higher Education. The data, analytic samples, and methods are summarized in box 2, and details are in appendix B. The study's limitations are summarized in box 3.

Box 2. Data and methods

Population

The study team collected deidentified student data from the Minnesota Statewide Longitudinal Education Data System. The population for research question 1 consisted of all students who graduated from a Minnesota public high school between 2008 and 2015 (N = 470,043). The population for research questions 2 and 3 consisted of all students who graduated from a Minnesota public high school between 2008 and 2010 (N = 179,831). These three cohorts are the most recent cohorts that could be followed in the statewide longitudinal data system for six years after high school graduation.

Data types

The study examined high school graduates' college enrollment and employment within one year of graduation and their outcomes six years after graduation, including college certificate and degree attainment, employment, and annual earnings.

The study team collected and analyzed data on the following variables:

- *Student characteristics.* Data included gender, race/ethnicity, socioeconomic status (as measured by eligibility for the national school lunch program), English proficiency, and disability status (as measured by having an Individualized Education Program).
- *High school characteristics.* Data included rurality (rural or nonrural). High school rurality was based on National Center for Education Statistics school identification codes (Phan & Glander, 2008). Rural high schools included high schools with the following school identification codes: rural, fringe; rural, distant; and rural, remote. Nonrural high schools included high schools with all other school identification codes.
- *Characteristics of colleges.* Data included two college types: less-than-four-year colleges and four-year colleges. College type is based on the highest degree offered. Less-than-four-year colleges grant college certificates or associate's degrees, while four-year colleges grant bachelor's degrees or higher. Some four-year colleges also grant college certificates or associate's degrees.
- *Postsecondary enrollment and attainment measures.* Data included student-level measures of enrollment in any less-than-four-year or four-year college in the United States within one year of high school graduation, as well as highest college certificate or degree attained from any postsecondary institution in the United States within six years of high school graduation and degree type (associate's degree, bachelor's degree, or higher).
- *Employment measures.* Data included student-level measures of quarterly earnings and hours worked provided by employers that are subject to unemployment insurance taxes in Minnesota. These data were used to create two new variables: employment and annual earnings. Employment was a dichotomous indicator for being employed or not being employed. A graduate who worked at least 10 hours and earned at least $6 an hour in at

(continued)

Box 2. Data and methods *(continued)*

least one quarter was considered employed in that year. Annual earnings were calculated as the sum of four quarters of earnings for graduates who were considered employed based on these criteria.

- *Initial postsecondary pathway.* To answer research question 1, postsecondary enrollment and employment measures were used to construct six initial postsecondary pathways (see box 1). To answer research questions 2 and 3, four pathways (less-than-four-year college only; less-than-four-year college, employed; four-year college only; and four-year college, employed) were collapsed into two categories—less-than-four-year college and four-year college—for ease of analysis.

Methods

Descriptive statistics were calculated to answer the research questions. Differences of greater than 5 percentage points for percentage values and differences of greater than 5 percent for dollar values were considered substantively meaningful and are reported in the findings section. For a more detailed account of data collection and the methods used to address the research questions, see appendix B.

Box 3. Limitations

This study has four main limitations. First, the findings are descriptive and should not be interpreted as causal. The variables analyzed—differences by high school rurality and student characteristics—are likely to reflect other unmeasured social and nonacademic differences, such as graduates' motivation levels, self-discipline, perseverance, family traditions, and family or school resources, rather than causes.

Second, because of data limitations, the study did not examine all potential pathways that graduates follow after high school graduation. For example, graduates might enter military service or become employed outside Minnesota or in a tribal nation in Minnesota. These graduates would be captured as "other" in the analyses and reporting. Because the "other" category includes graduates with very different trajectories (such as graduates who were unemployed in Minnesota or employed outside Minnesota), the study team is cautious in drawing conclusions from the findings on their employment outcomes.

Third, the study captures only the credentials attained by Minnesota public high school graduates from postsecondary institutions following high school graduation. Some high school graduates attain industry credentials while attending high school (such as a certified nurse assistant credential) or through on-the-job training. Other graduates may attain college certificates through dual-enrollment programs.

Fourth, the annual earnings reported in the study reflect income six years after high school graduation and do not show the full income trajectory associated with following a particular postsecondary pathway. For example, some students who complete a college degree may subsequently enroll in graduate school. These individuals are likely to have substantially higher earnings 10–20 years after graduating from high school. Similarly, many high school graduates who enter a trade are likely to still be in an apprenticeship six years after graduation. They are likely to have substantially higher earnings 7–10 years after graduating from high school.

What the study found

About 92 percent of 2008–15 Minnesota public high school graduates were enrolled in college or employed within one year of high school graduation. Initial postsecondary pathways varied by student characteristics but not by high school rurality. There were also differences in college certificate and degree attainment, employment, and annual earnings six years after high school graduation by student characteristics, even among graduates who followed the same initial postsecondary pathway.

Within one year of high school graduation, nearly all graduates were enrolled in college or employed; initial postsecondary pathways varied by student characteristics but not by high school rurality

Within one year of high school graduation, 92 percent of 2008–15 Minnesota public high school graduates were enrolled in college or employed. About 19 percent were employed but not enrolled in college, 5 percent were enrolled in a less-than-four-year college only, 11 percent were enrolled in a four-year college only, 22 percent were simultaneously enrolled in a less-than-four-year college and employed, and 36 percent were simultaneously enrolled in a four-year college and employed (table 1). About 8 percent of graduates were neither enrolled in college nor employed in Minnesota.[1] Graduates of rural high schools followed each of these six postsecondary pathways at rates similar to those of graduates of nonrural high schools. However, initial postsecondary pathways varied by student characteristics.

Male graduates, racial/ethnic minority graduates, economically disadvantaged graduates (defined as being eligible for the national school lunch program), graduates with limited English proficiency, and graduates with disabilities (defined as having an Individualized Education Program) were less likely than their counterparts to be enrolled in a four-year college within one year of high school graduation. For example, 19 percent of Black graduates and 16 percent of American Indian/Alaska Native and of Hispanic graduates combined four-year-college enrollment with employment compared with 27 percent of Asian/Pacific Islander graduates and 39 percent of White graduates (see table 1).[2]

Conversely, male graduates, racial/ethnic minority graduates, economically disadvantaged graduates, graduates with limited English proficiency, and graduates with disabilities were more likely than their counterparts to be employed but not enrolled in college. For example, 37 percent of graduates with disabilities were employed but not enrolled in college compared with 16 percent of graduates without disabilities (see table 1).

Graduates with disabilities, graduates with limited English proficiency, Hispanic graduates, and American Indian graduates were the most likely to be neither employed nor enrolled in college within one year of high school graduation

Among 2008–15 Minnesota public high school graduates, 25 percent of graduates with disabilities, 21 percent of graduates with limited English proficiency, and 18 percent of Hispanic graduates and of American Indian graduates were neither employed nor enrolled in college within one year of high school graduation (see table 1). The high rate for graduates with disabilities may reflect the presence in this category of some graduates whose disabilities limit their education and employment opportunities.

Table 1. Percentage of 2008–15 Minnesota public high school graduates following each initial postsecondary pathway within one year of high school graduation, by student characteristic and high school rurality

Characteristic	Total number	Employed, no college	Less-than-four-year college only	Four-year college only	Less-than-four-year college, employed	Four-year college, employed	Not employed, no college[a]
All graduates	470,043	18.5	4.8	11.2	21.7	35.5	8.3
Gender							
Female	234,522	15.2	4.2	12.1	21.5	40.2	6.8
Male	235,521	21.6	5.4	10.4	21.9	30.9	9.8
Race/ethnicity							
American Indian/Alaska Native	7,088	31.8	7.3	5.6	21.1	16.0	18.3
Asian/Pacific Islander	28,898	16.5	8.2	17.0	20.5	27.2	10.6
Black, non-Hispanic	34,204	22.4	8.9	8.6	29.3	19.4	11.4
Hispanic/Latino	19,848	27.4	7.4	6.4	24.5	16.0	18.4
White, non-Hispanic	380,005	17.5	4.0	11.4	21.0	39.0	7.1
Socioeconomic status							
Economically disadvantaged	159,510	29.1	6.9	6.5	25.7	18.8	13.0
Not economically disadvantaged	310,533	13.0	3.7	13.7	19.7	44.1	5.9
English proficiency							
Limited proficiency	10,715	24.6	13.5	4.8	28.3	7.6	21.2
Proficient	459,328	18.3	4.6	11.4	21.5	36.2	8.0
Disability status							
With disabilities	49,502	36.7	8.1	3.3	21.4	5.3	25.2
Without disabilities	420,541	16.3	4.4	12.2	21.7	39.1	6.3
High school rurality							
Rural	146,336	18.4	4.4	9.7	23.0	36.4	8.0
Nonrural	323,707	18.5	4.9	11.9	21.1	35.1	8.4

Note: Percentages may not sum to 100 percent because of rounding. Differences of greater than 5 percentage points are considered substantively meaningful.

a. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

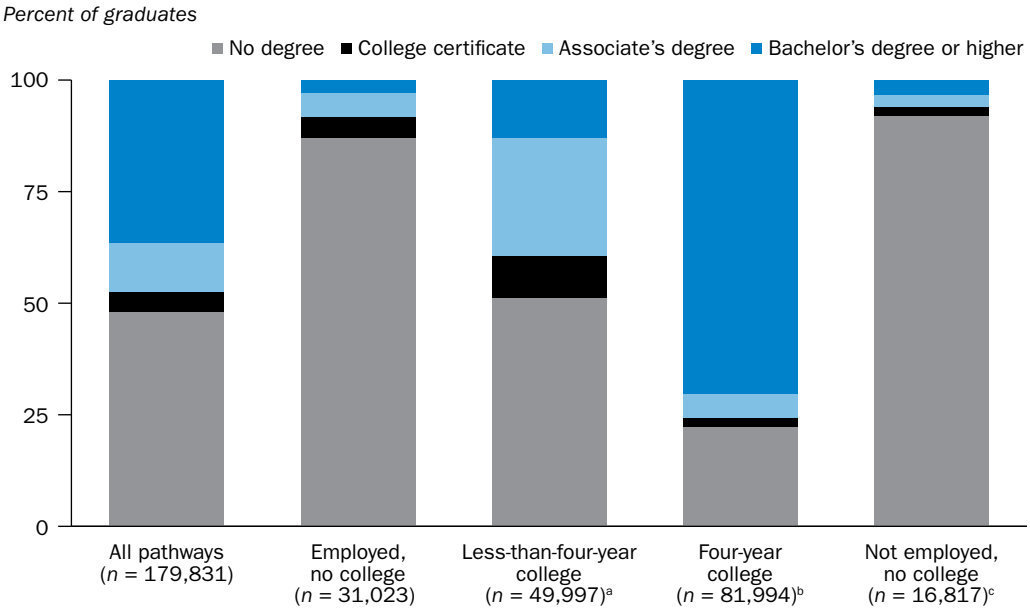
Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Rates of college certificate and degree attainment six years after high school graduation varied by initial postsecondary pathway and student characteristics

Six years after high school graduation, about half of 2008–10 Minnesota public high school graduates had attained a college certificate or degree: 37 percent had attained a bachelor's degree or higher, 11 percent had attained an associate's degree, and 4 percent had attained a college certificate (figure 1 and table 2). Attainment rates varied by initial postsecondary pathway and student characteristics but not by high school rurality.

Types of degrees attained varied by initial postsecondary pathway. The analysis of college certificate and degree attainment six years after high school graduation suggests that graduates seldom experienced success in pathways different from the ones in which they began (see figure 1 and table 2). For example, only 13 percent of graduates who enrolled in a less-than-four-year college and 3 percent of graduates who were employed but not enrolled in

Figure 1. Types of degrees attained by 2008–10 Minnesota public high school graduates six years after high school graduation varied by initial postsecondary pathway



a. Includes graduates who enrolled in a less-than-four-year college only or who combined less-than-four-year college enrollment with employment.

b. Includes graduates who enrolled in a four-year college only or who combined four-year college enrollment with employment.

c. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

college attained a bachelor's degree or higher compared with 71 percent of graduates who enrolled in a four-year college.

Graduates who enrolled in a less-than-four-year college were more likely than graduates who followed all other pathways to have attained a college certificate or associate's degree six years after high school graduation. However, college certificate and associate's degree attainment rates were low even for graduates who began on these pathways. Among graduates who enrolled in a less-than-four-year college, 9 percent had attained a college certificate and 27 percent had attained an associate's degree six years after high school graduation.

Types of degrees attained varied by student characteristics. Six years after high school graduation, there were differences in college certificate and degree attainment by gender, race/ethnicity, socioeconomic status, English proficiency, and disability status (table 3). Male graduates were less likely than female graduates to have attained a bachelor's degree or higher (31 percent versus 42 percent) and more likely not to have attained any degree (55 percent versus 41 percent). Although 40 percent of White graduates and 32 percent of Asian graduates attained a bachelor's degree or higher, only 17 percent of Black graduates, 15 percent of Hispanic graduates, and 11 percent of American Indian graduates attained a bachelor's degree or higher. Economically disadvantaged graduates attained college certificates and associate's degrees at similar rates to graduates who were not economically

Table 2. Percentage of 2008–10 Minnesota public high school graduates attaining a college certificate or degree six years after high school graduation, by initial postsecondary pathway

Initial postsecondary pathway	Total number	No college certificate or degree	College certificate	Associate's degree	Bachelor's degree or higher
All graduates	179,831	48.0	4.4	11.0	36.6
Employed, no college	31,023	87.0	4.6	5.4	3.0
Less-than-four-year college	49,997	51.2	9.3	26.5	12.9
Four-year college	81,994	22.3	1.8	5.4	70.5
Not employed, no college[a]	16,817	91.8	2.1	2.8	3.3

Note: Percentages may not sum to 100 percent because of rounding. Differences of greater than 5 percentage points are considered substantively meaningful.

a. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Table 3. Percentage of 2008–10 Minnesota public high school graduates attaining a college certificate or degree six years after high school graduation, by student characteristic and high school rurality

Characteristic	Total number	No college certificate or degree	College certificate	Associate's degree	Bachelor's degree or higher
All graduates	179,831	48.0	4.4	11.0	36.6
Gender					
Female	89,864	40.6	5.8	11.5	42.1
Male	89,967	55.4	3.0	10.6	31.0
Race/ethnicity					
American Indian/Alaska Native	2,735	77.5	4.1	7.2	11.2
Asian/Pacific Islander	10,074	53.6	4.6	9.8	32.0
Black, non-Hispanic	11,731	71.8	5.4	6.3	16.5
Hispanic/Latino	5,955	72.2	4.4	8.3	15.1
White, non-Hispanic	149,336	44.3	4.3	11.7	39.8
Socioeconomic status					
Economically disadvantaged	55,602	68.0	5.4	10.5	16.2
Not economically disadvantaged	124,229	39.1	4.0	11.3	45.7
English proficiency					
Limited proficiency	3,945	75.4	6.6	8.8	9.3
Proficient	175,886	47.4	4.4	11.1	37.2
Disability status					
With disabilities	18,092	82.1	5.1	7.5	5.3
Without disabilities	161,739	44.2	4.3	11.4	40.1
High school rurality					
Rural	57,040	46.7	4.7	13.6	34.9
Nonrural	122,791	48.6	4.3	9.8	37.3

Note: Percentages may not sum to 100 percent because of rounding. Differences of greater than 5 percentage points are considered substantively meaningful.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

disadvantaged but were less likely to attain a bachelor's degree or higher (16 percent versus 46 percent). Graduates with limited English proficiency were less likely than graduates who were English proficient to attain a bachelor's degree or higher (9 percent versus 37 percent). Finally, graduates with disabilities were less likely than graduates without disabilities to attain a bachelor's degree or higher (5 percent versus 40 percent).

Differences in rates of college certificate and degree attainment six years after high school graduation by student characteristics remained, even among graduates who followed the same initial postsecondary pathway

To determine whether disparities in college certificate and degree attainment rates by student characteristics were related to differences in initial postsecondary pathway, the study examined the college certificate and degree attainment data for 2008–10 Minnesota public high school graduates who followed the same initial postsecondary pathway.

Differences in college certificate, associate's degree, and bachelor's degree attainment remained when comparisons were limited to graduates who followed the same initial postsecondary pathway. For example, among graduates who enrolled in a four-year college within one year of high school graduation, male graduates were less likely than female graduates to have attained a bachelor's degree or higher (67 percent versus 74 percent; see table C1 in appendix C). Patterns for other student characteristics were also similar to those for the entire sample when only graduates who followed the same initial postsecondary pathway were compared: racial/ethnic minority graduates, economically disadvantaged graduates, graduates with limited English proficiency, and graduates with disabilities were less likely than their counterparts to attain a college degree. (Detailed findings for each initial postsecondary pathway are presented in appendix C.)

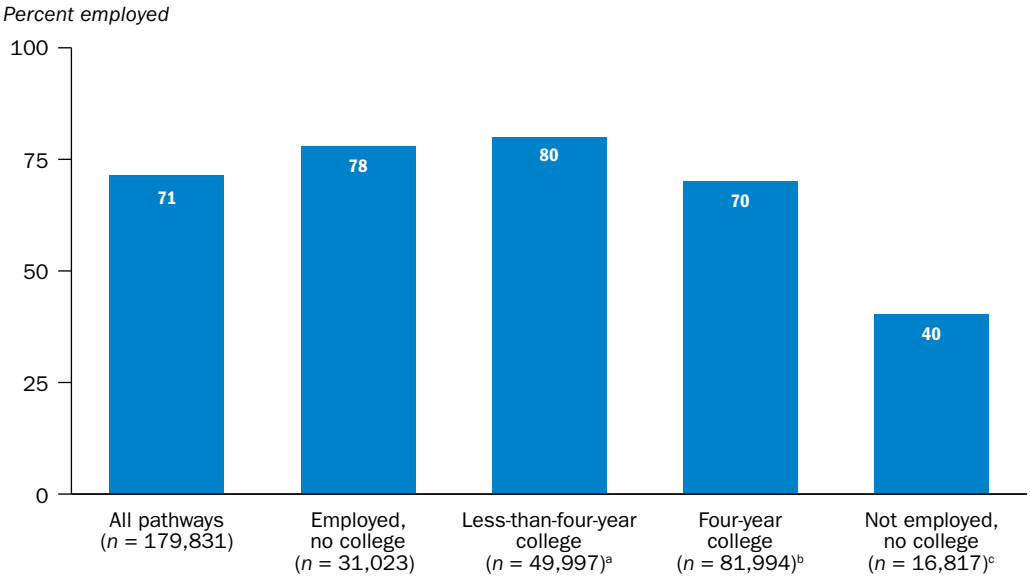
Employment rates and median annual earnings six years after high school graduation varied by initial postsecondary pathway, highest degree attained, student characteristics, and high school rurality

Six years after high school graduation, 71 percent of 2008–10 Minnesota public high school graduates were employed and their median annual earnings were $22,717 (figure 2 and table 4).[3] Employment rates and earnings varied by initial postsecondary pathway, highest degree attained, student characteristics, and high school rurality.

Employment rates and median annual earnings varied by initial postsecondary pathway. Graduates who were not employed and did not enroll in college within one year of high school graduation had the lowest employment rate and earnings (see figure 2 and table 4). Graduates enrolled in a less-than-four-year college had the highest employment rate, while those enrolled in a four-year college had the highest earnings.

Employment rates and median annual earnings varied by highest degree attained. Graduates who attained a college certificate or an associate's degree six years after high school graduation had the highest employment rate (82 percent and 83 percent compared with 71 percent of graduates who had not attained a degree and 70 percent of graduates who had attained a bachelor's degree or higher; see table 4).[4] Despite lower employment rates, graduates who had attained a bachelor's degree or higher had the highest median earnings ($27,639), followed by graduates who had attained an associate's degree ($25,341), graduates who had attained a college certificate ($23,044), and graduates who had not attained a degree ($19,495).

Figure 2. Employment rates among 2008–10 Minnesota public high school graduates six years after high school graduation varied by initial postsecondary pathway



a. Includes graduates who enrolled in a less-than-four-year college only or who combined less-than-four-year college enrollment with employment.

b. Includes graduates who enrolled in a four-year college only or who combined four-year college enrollment with employment.

c. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Employment rates and median annual earnings varied by student characteristics. Male and female graduates had similar employment rates six years after high school graduation, but male graduates had higher annual earnings ($23,957 versus $21,693; table 5). Asian, Black, and White graduates had higher employment rates (72 percent for each) than Hispanic graduates (66 percent). White graduates had the highest annual earnings ($23,403), while American Indian graduates had the lowest ($16,370). Economically disadvantaged graduates and graduates who were not economically disadvantaged had similar employment rates, but economically disadvantaged graduates had lower annual earnings ($19,848 versus $24,274). Graduates with limited English proficiency had lower employment rates (64 percent) than graduates who were English proficient (72 percent) and lower annual earnings ($20,944 versus $22,754). Finally, graduates with disabilities had lower employment rates (66 percent) than graduates without disabilities (72 percent) and lower annual earnings ($16,482 versus $23,443).

Employment rates and median annual earnings varied by rurality. Six years after high school graduation, graduates who had attended rural high schools and graduates who had attended nonrural high schools had similar employment rates, and graduates who had attended rural high schools had higher annual earnings ($23,572 versus $22,315; see table 5).

Table 4. Percentage of 2008–10 Minnesota public high school graduates who were employed six years after high school graduation and their annual earnings, by initial postsecondary pathway and highest degree attained

Characteristic	Total number	Graduates who were employed		Annual earnings[a]		
		Number	Percent[b]	Median	25th percentile[c]	75th percentile[c]
All graduates	179,831	128,241	71.3	$22,717	$11,282	$34,957
Initial postsecondary pathway						
Employed, no college	31,023	24,120	77.8	$20,566	$10,548	$31,267
Less-than-four-year college	49,997	39,947	79.9	$22,739	$12,384	$33,444
Four-year college	81,994	57,420	70.0	$25,195	$11,921	$38,903
Not employed, no college[d]	16,817	6,754	40.2	$14,115	$5,791	$24,316
Highest degree attained						
No degree	86,331	59,450	71.3	$19,495	$9,785	$29,686
College certificate	7,923	6,516	82.2	$23,044	$13,375	$33,228
Associate's degree	19,829	16,367	82.5	$25,341	$13,985	$36,747
Bachelor's degree or higher	65,748	45,908	69.8	$27,639	$12,754	$41,442

a. Earnings are for graduates who were employed and had nonzero earnings in at least one quarter of the year.

b. Differences of greater than 5 percentage points are considered substantively meaningful.

c. Percentile refers to the percentage of graduates who earned at or below the value indicated. For example, six years after high school graduation 25 percent of all employed graduates earned $11,828 or less, and 75 percent earned $34,957 or less. Put differently, half of all employed graduates earned between $11,828 and $34,957 six years after high school graduation.

d. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Table 5. Percentage of 2008–10 Minnesota public high school graduates who were employed six years after high school graduation and their annual earnings, by student characteristic and high school rurality

Characteristic	Total number	Graduates who were employed		Annual earnings[a]		
		Number	Percent[b]	Median	25th percentile[c]	75th percentile[c]
All graduates	179,831	128,241	71.3	$22,717	$11,282	$34,957
Gender						
Female	89,864	64,566	71.9	$21,693	$10,998	$32,652
Male	89,967	63,675	70.8	$23,957	$11,611	$37,599
Race/ethnicity						
American Indian/Alaska Native	2,735	1,848	67.6	$16,370	$6,864	$26,357
Asian/Pacific Islander	10,074	7,296	72.4	$22,858	$12,018	$32,665
Black, non-Hispanic	11,731	8,385	71.5	$17,141	$7,570	$27,568
Hispanic/Latino	5,955	3,900	65.5	$21,153	$11,108	$31,100
White, non-Hispanic	149,336	106,812	71.5	$23,403	$11,752	$35,946
Socioeconomic status						
Economically disadvantaged	55,602	40,033	72.0	$19,848	$9,837	$30,382
Not economically disadvantaged	124,229	88,208	71.0	$24,274	$12,116	$37,075
English proficiency						
Limited proficiency	3,945	2,509	63.6	$20,944	$10,320	$30,436
Proficient	175,886	125,732	71.5	$22,754	$11,299	$35,056
Disability status						
With disabilities	18,092	11,947	66.0	$16,482	$7,269	$26,903
Without disabilities	161,739	116,294	71.9	$23,443	$11,884	$35,642
High school rurality						
Rural	57,040	40,153	70.4	$23,572	$11,879	$36,082
Nonrural	122,791	88,088	71.7	$22,315	$11,053	$34,409

a. Earnings are for graduates who were employed and had nonzero earnings in at least one quarter of the year. Differences of greater than 5 percent are considered substantively meaningful.

b. Differences of greater than 5 percentage points are considered substantively meaningful.

c. Percentile refers to the percentage of graduates who earned at or below the value indicated. For example, six years after high school graduation 25 percent of all employed graduates earned $11,282 or less, and 75 percent earned $34,957 or less. Put differently, half of all employed graduates earned between $11,282 and $34,957 six years after high school graduation.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Differences in employment rates and annual earnings six years after high school graduation by student characteristics remained, even among graduates who followed the same initial postsecondary pathway

When comparisons of employment rates and annual earnings were limited to 2008–10 Minnesota public high school graduates who followed the same initial postsecondary pathway, some differences based on student characteristics became smaller, while others became larger or were reversed. For example, male graduates still had higher annual earnings than female graduates. However, the differences were smaller for graduates with more education. (Detailed findings by initial postsecondary pathway are presented in appendix C.)

Implications of the study findings

The results of this study have several implications for educators and policymakers to consider.

High schools might explore ways to expand college readiness opportunities for racial/ethnic minority students, economically disadvantaged students, students with limited English proficiency, and students with disabilities

Historically, racial/ethnic minority students, economically disadvantaged students, students with limited English proficiency, and students with disabilities have been less likely than their peers to enroll in college (Kanno & Cromley, 2013, 2015; McFarland et al., 2017; Newman, Wagner, Cameto, & Knokey, 2009; Ross et al., 2012). The current study also finds that Minnesota public high school graduates with these characteristics are less likely than their counterparts without these characteristics to enroll in college. That may suggest differential access to the kinds of instruction, curricula, and experiences that prepare students for college enrollment and success. To reduce disparities in college enrollment and degree attainment, high schools might consider directing more college readiness resources such as college preparation courses and college counseling to students who are less likely than their counterparts to enroll in college, particularly racial/ethnic minority students, economically disadvantaged students, students with limited English proficiency, and students with disabilities.

High schools might consider directing more intensive resources to students who are the most at risk during the transition to postsecondary education and employment

Graduates with disabilities, graduates with limited English proficiency, Hispanic graduates, and American Indian graduates were the most likely to be neither employed nor enrolled in college within one year of high school graduation. These students may need additional resources, such as a guide to transition planning, to help them navigate the transition from high school to postsecondary education and employment.

An employment resource guide jointly published by the Minnesota Department of Education and the Minnesota Department of Employment and Economic Development (2017) lays out some steps that students with disabilities could take in each year of high school to prepare for careers and college. For example, the guide recommends that students begin career exploration, including taking career aptitude surveys and interest inventories, in grade 9. The guide also recommends that students learn more about their disability so that they are better able to advocate for their needs. Students can practice self-advocacy by taking on increasing responsibility for leading their Individualized Education Program meetings. With a strong understanding of their needs, interests, and strengths, students with disabilities may be better positioned for employment or additional training and education. The Minnesota Department of Education might consider other options for providing extra support to students most at risk of not enrolling in college or entering the workforce within one year of high school graduation.

High schools could share information with students about the earnings of past cohorts of students and about how earnings differed across postsecondary pathways

This study finds differences in earnings six years after high school graduation by type of college degree attained. Graduates who had not attained a college degree had median earnings of $19,495 six years after high school graduation compared with $23,044 for graduates who had attained a college certificate, $25,341 for graduates who had attained an associate's degree, and $27,639 for graduates who had attained a bachelor's degree or higher (see table 4). High schools might consider using labor-market data to guide students' career planning. For example, high schools could share data with students to help them understand how wages differ by career field and education level. High schools also might consider helping students understand the cost of living so they may more firmly grasp the consequences of differences in earnings.

Colleges might explore ways to support degree attainment among male students, racial/ethnic minority students, economically disadvantaged students, students with limited English proficiency, and students with disabilities

This study also finds differences in college certificate and degree attainment based on student characteristics, even among students who followed the same initial postsecondary pathway. That is, graduates who followed the same pathway within one year of high school graduation had different outcomes based on their race/ethnicity, socioeconomic status, English proficiency, and disability status. This finding suggests that supports for college readiness and enrollment provided by high schools are not enough to close the opportunity gap.

To succeed in college, some graduates need extra support once on campus. Less than half of graduates who enrolled in a less-than-four-year college had attained a college certificate or degree six years later. Attainment rates are especially low for male graduates, racial/ethnic minority graduates, economically disadvantaged graduates, graduates with limited English proficiency, and graduates with disabilities. Colleges, especially less-than-four-year colleges, might consider directing resources to these students. Less-than-four-year colleges could consider what guidance, supports, or structures they could offer to students when they enroll to increase the percentage of students who go on to attain a college certificate or degree.

Appendix A. Literature review

Nationally, 69 percent of 2015 high school graduates immediately enrolled in college (McFarland et al., 2017). Studies have found that students with certain characteristics are less likely to leave high school ready for college and careers. This appendix briefly discusses what is known about college and career readiness and success by rurality, gender, race/ethnicity, socioeconomic status, English proficiency, and disability status.

Rurality

Studies suggest that students in rural areas receive lower levels of educational preparation for transitions to postsecondary education and employment (Byun, Meece, & Irvin, 2012; Hu, 2003) and have lower participation rates in academically advanced school curricula than do students in nonrural areas (Byun et al., 2012; Graham, 2009; Griffin, Hutchins, & Meece, 2011). Indeed, the barriers to college are greater for rural students than for nonrural students. Students in rural areas tend to come from families with lower socioeconomic status (Schaefer & Meece, 2009) and to live farther from postsecondary institutions (Burke, Davis, & Stephan, 2015; Gillie, Isenhour, & Rasmussen, 2006; Rouse, 1995; Turley, 2009). In addition, teachers in rural high schools have lower expectations about their students' postsecondary education than do teachers in nonrural high schools (Molefe, Burke, Collins, Sparks, & Hoyer, 2017). The result, especially in the Regional Educational Laboratory Midwest Region, is that rural students who aspire to attain a bachelor's degree are more likely than nonrural students to fall short of that goal (Molefe et al., 2017).

In addition, graduates of rural high schools are less likely than graduates of nonrural high schools to enroll immediately in a selective postsecondary institution, even after academic achievement is controlled for (Karen, 2002). Among 2010 Indiana high school graduates, a higher proportion of graduates of rural than of nonrural high schools enrolled immediately in a less-than-four-year public, in-state institution (31 percent versus 25 percent) and chose "undermatched " institutions, meaning institutions that were less selective than the students' presumptive college eligibility based on high school academic performance (29 percent of rural graduates versus 24 percent of nonrural graduates; Burke et al., 2015). Furthermore, for every 10-mile increase in a high school's distance from a four-year institution, the likelihood of enrolling in a less-than-four-year institution instead of a four-year institution increased by 5 percentage points while the likelihood of enrolling in an undermatched institution increased by 3 percentage points (Burke et al., 2015).

Gender

In the past two decades, female students have surpassed male students in many secondary and postsecondary outcomes, including high school attainment, college enrollment, and college degree attainment (Cragg, 2009; Kena et al., 2014). Among 2004 high school graduates nationally, 74 percent of female graduates immediately enrolled in postsecondary education compared with 67 percent of male graduates (Ross et al., 2012). Moreover, in 2014 female students obtained a bachelor's degree or higher at a rate that was 6 percentage points higher than the rate for male students (Kena et al., 2014).

Many of these gender gaps in outcomes can be explained by students' prior education experiences, including attendance patterns, credit accumulation, and academic performance

(DiPrete & Buchmann, 2013; Ewert, 2012; Flashman, 2013). Scores on the National Assessment of Educational Progress show that female students outperform male students in reading as early as grade 4 and that they continue to outperform male students through high school. Although male students outperform female students in math, high-performing female students are more likely than high-performing male students to subsequently enroll in advanced math courses (Ross et al., 2012).

Race/ethnicity

Although more than 70 percent of 2004 high school graduates nationally enrolled directly in postsecondary education, students of some racial/ethnic groups are much less likely to enroll in college immediately after high school (Ross et al., 2012). Most likely to make an immediate transition to postsecondary education are Asian graduates (85 percent) and White graduates (74 percent; Ross et al., 2012). In comparison, 63 percent of Black graduates, 58 percent of Hispanic graduates, and 52 percent of American Indian graduates from the same cohort made an immediate transition to college (Ross et al., 2012).

The differential college outcomes by race/ethnicity may be due to a variety of factors, including lower socioeconomic status, historical disadvantage, and lack of access to high-quality education experiences. Of 2015 high school graduates who took the ACT®, 59 percent of Asian and 50 percent of White students met three or more college readiness benchmarks compared with 25 percent of Hispanic graduates, 18 percent of American Indian graduates, and 12 percent of Black graduates (ACT, Inc., 2015). In addition, in 2009, 60 percent of grade 9 high school guidance counselors reported that their primary goal was postsecondary planning and preparation in the case of Asian students, 51 percent in the case of White students, 44 percent in the case of Black students, 41 percent in the case of Hispanic students, and 29 percent in the case of American Indian students (Ross et al., 2012).

Gaps by race/ethnicity are magnified by the types of postsecondary institutions in which high school graduates enroll. For example, among 2010 high school graduates who took the SAT, Asian and White graduates were more likely than American Indian, Black, and Hispanic graduates to enroll in a four-year college, whereas American Indian, Black, and Hispanic graduates were more likely than Asian and White graduates to enroll in a less-than-four-year college (McKillip & Mackey, 2013). These patterns are noteworthy because high school students who take the SAT are among the students most likely planning to enroll in a four-year institution immediately following high school graduation, and American Indian, Black, and Hispanic graduates who take the SAT fall short of these plans in greater proportions than Asian and White graduates. Moreover, research has underscored the importance of enrolling in the most selective college to which one has access, finding that students who enroll in more selective colleges are more likely to attain a degree than students who enroll in less selective colleges, even after precollege characteristics are controlled for (Alon & Tienda, 2005; Bowen & Bok, 1998; Bowen, Chingos, & McPherson, 2009; Hess, Schneider, Carey, & Kelly, 2009; Kurlaender & Grodsky, 2013; Small & Winship, 2007).

Socioeconomic status

In 2015 gaps in immediate postsecondary enrollment rates between recent high school graduates from low-income families and those from middle-income families converged for the first time since 1990 (Kena et al., 2016; McFarland et al., 2017). However, these graduates' enrollment rates still lag 20 percentage points behind those of their peers from high-income families (McFarland et al., 2017).[5] Moreover, an analysis using data from the Education Longitudinal Study of 2002 revealed that 8 percent of students from low-income families and 29 percent of students from middle-income families attained a bachelor's degree within eight years of graduating from high school compared with 60 percent of students from high-income families (Kena et al., 2014). This relationship persisted even after the analysis controlled for other demographic variables (Adelman, 2006), the number of math and science courses taken in college, the type of college (less-than-four-year or four-year college), and family and peer support (Cabrera, Burkum, LaNasa, & Bibo, 2012).

English proficiency

Nearly 10 percent of public school students in the United States are English learner students, meaning that they participate in language assistance programs to help them achieve English proficiency (Snyder, de Bray, & Dillow, 2016). It is well documented that English learner students graduate from high school, enroll in postsecondary education, and complete college degrees at lower rates than their English-proficient peers (Kanno & Cromley, 2013, 2015). Lower rates of postsecondary enrollment and degree attainment may also be related to lower socioeconomic status, lower educational aspirations, and lower academic achievement in high school (Kanno & Cromley, 2015; Núñez & Sparks, 2012).

Disability status

The National Longitudinal Transition Study-2 draws the most recent picture of the post–high school experiences of youth with documented disabilities across several domains, including visual impairment, learning disability, emotional disturbance, and speech/language impairment (Newman et al., 2009). These data show that by four years after leaving high school, 45 percent of all out-of-high-school youth with disabilities had ever enrolled in any form of postsecondary education compared with 53 percent of all out-of-high-school youth in the general population. Differences in postsecondary enrollment between youth with disabilities and youth in the general population widen for four-year college enrollment: 8 percent of all out-of-high-school youth with disabilities were enrolled in a four-year college four years after leaving high school compared with 29 percent of all out-of-high-school youth in the general population.[6] Among youth with disabilities, there is variation in college enrollment. For example, 44 percent of youth with a visual impairment enrolled in a four-year college within four years of leaving high school compared with 16 percent of youth with a learning disability (Newman et al., 2009).

Appendix B. Study methodology

This appendix describes the data sources, data processing, and data analysis to answer the following research questions:

1. What percentage of 2008–15 Minnesota public high school graduates transitioned from high school to employment, college, or a combination of employment and college within one year of high school graduation?

2. What was the highest college certificate or degree attained by 2008–10 Minnesota public high school graduates six years after high school graduation?

3. What percentage of 2008–10 Minnesota public high school graduates were employed six years after high school graduation? What were their annual earnings?

Data sources

The study team worked with the Minnesota Office of Higher Education to acquire student data from the Minnesota Statewide Longitudinal Education Data System. The data consisted of deidentified student-level K–12 information (enrollment and demographic data, managed by the Minnesota Department of Education); student-level postsecondary information (enrollment and National Student Clearinghouse [n.d.] data, managed by the Minnesota Office of Higher Education); and student-level employment information (quarterly earnings, managed by the Minnesota Department of Employment and Economic Development). Urban-centric locale codes for Minnesota high schools were downloaded from the National Center for Education Statistics Elementary/Secondary Information System website (U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, n.d. a). Minnesota Office of Higher Education postsecondary data were supplemented with publicly available data accessed through the Integrated Postsecondary Education Data System website (U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, n.d. b).

Data processing

This section details the two study populations, the creation of variables, and the extent to which data were missing for the variables in the analysis.

The study populations. The study team received data on all 2008–15 Minnesota public high school graduates, with each graduate identified by an anonymous identification number. The full population of 2008–15 graduates (470,043 graduates) was analyzed to answer research question 1 on initial postsecondary pathways and the full population of 2008–10 graduates (179,831 graduates) was analyzed to answer research questions 2 and 3 on college certificate and degree attainment and employment six years after graduation. (The characteristics of the two study populations are described in table B1.)

Variable creation. This section describes the existing variables and the variables that were created from the raw data.

Table B1. Characteristics of the study populations

Characteristic	2008–15 Minnesota public high school graduates (*N* = 470,043)		2008–10 Minnesota public high school graduates (*N* = 179,831)	
	Number	Percent	Number	Percent
All graduates	470,043	100.0	179,831	100.0
Gender				
Female	234,522	49.9	89,864	50.0
Male	235,521	50.1	89,967	50.0
Race/ethnicity				
American Indian/Alaska Native	7,088	1.5	2,735	1.5
Asian/Pacific Islander	28,898	6.1	10,074	5.6
Black, non-Hispanic	34,204	7.3	11,731	6.5
Hispanic/Latino	19,848	4.2	5,955	3.3
White, non-Hispanic	380,005	80.8	149,336	83.0
Socioeconomic status				
Economically disadvantaged	159,510	33.9	55,602	30.9
Not economically disadvantaged	310,533	66.1	124,229	69.1
English proficiency				
Limited proficiency	10,715	2.3	3,945	2.2
Proficient	459,328	97.7	175,886	97.8
Disability status				
With disabilities	49,502	10.5	18,092	10.1
Without disabilities	420,541	89.5	161,739	89.9
High school rurality				
Rural	146,336	31.1	57,040	31.7
Nonrural	323,707	68.9	122,791	68.3

Note: Percentages may not sum to 100 percent because of rounding.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Student characteristics. Gender is a dichotomous variable that is reported as being female or male. Race/ethnicity is a series of variables for belonging to one of five racial/ethnic groups: American Indian or Alaska Native; Asian, Pacific Islander, or Native Hawaiian; Black or African-American; Hispanic or Latino; or White, non-Hispanic. Socioeconomic status is defined by being eligible or not being eligible for the national school lunch program, a proxy for economic disadvantage. English proficiency is defined by qualifying for English language services at the time of high school graduation (limited proficiency) or not qualifying (proficient). Disability status is defined as having a disability at the time of high school graduation.

Rurality. Rurality refers to the locale of the high school from which a student graduated. National Center for Education Statistics school identification codes and data from the Elementary and Secondary Education System were used to determine school locale (Phan & Glander, 2008). Any locale defined as "rural, fringe," "rural, distant," or "rural, remote" was considered rural, while all other locales were considered nonrural. The study team considered dividing "nonrural" into "urban" and "suburban" categories but found only small differences between urban and suburban graduates in initial pathway (less than 3 percentage points) and employment rates (less than 5 percentage points). School locale data were not

available for 81 Minnesota public high schools. These high schools were assigned locale values based on the nearest high school's locale value.

Initial postsecondary pathway. Data from the Minnesota Statewide Longitudinal Education Data System on first-time postsecondary enrollment and employment immediately following high school graduation were used to create a variable that indicates the initial postsecondary pathway taken by Minnesota public high school graduates within one year of high school graduation. Six mutually exclusive pathways were identified:

- Employed, no college.
- Less-than-four-year college, not employed.
- Four-year college, not employed.
- Less-than-four-year college, employed.
- Four-year college, employed.
- Not employed, no college.

To answer research questions 2 and 3, these six mutually exclusive pathways were collapsed into four pathways:

- Employed, no college.
- Less-than-four-year college (combining graduates who enrolled in a less-than-four-year college only with graduates who combined less-than-four-year college enrollment with employment).
- Four-year college (combining graduates who enrolled in a four-year college only with graduates who combined four-year college enrollment with employment).
- Not employed, no college.

The Minnesota Office of Higher Education provided data for all enrollees of in-state public and private postsecondary institutions with less-than-four-year programs or four-year programs. The Minnesota Office of Higher Education also provided data for all Minnesota high school graduates enrolled in out-of-state public and private less-than-four-year and four-year postsecondary institutions through the National Student Clearinghouse. Approximately 98 percent of postsecondary institutions nationwide report enrollment data to the National Student Clearinghouse. High school graduates who attended institutions that did not report enrollment data to the National Student Clearinghouse are not counted as enrolled.

The study team downloaded data from the Integrated Postsecondary Education Data System website to determine whether a postsecondary institution was a less-than-four-year college or a four-year college. The Integrated Postsecondary Education Data System (the framework for classifying colleges and universities in the United States; Carnegie Classifications of Institutions of Higher Education, n.d.) provided classifications for the 2008/09, 2009/10, and 2010/11 academic years. Colleges that granted bachelor's degrees or higher were considered four-year colleges, even if they also granted associate's degrees. Colleges that granted only college certificates or associate's degrees were considered less-than-four-year colleges.

In three circumstances additional investigation was required to determine institution level. First, some institutional identification numbers did not align with Carnegie classifications (90 institutions with 3,223 graduates). Through online searches by institution name the study team was able to determine the Carnegie classification of 38 of these institutions

(with 2,228 graduates); the remaining 52 institutions (with 995 graduates) were coded "unknown." Second, 70 institutions (with 1,635 graduates) had Carnegie classifications that made it difficult to determine whether the institutions were less-than-four-year or four-year institutions. For example, an institution with the Carnegie classification of "other separate health profession schools" could be a less-than-four-year institution or a four-year institution. Finally, 55 institutions (with 2,610 graduates) had "unknown" Carnegie classifications (defined as "item not available" in the data). In the last two situations online searches by institution name determined the Carnegie classification of all but three institutions (with 5 graduates). In addition to the unresolved, unknown, or unclear Carnegie classifications, data for six graduates indicated that they had enrolled in a postsecondary institution that had no recorded Office of Postsecondary Education identification number for determining the type of institution. The "Missing data" section below explains the handling of institution type for these 1,006 graduates.

To determine whether graduates were employed within one year of high school graduation, the Minnesota Department of Employment and Economic Development provided quarterly earnings and employment data reported by employers that were subject to unemployment insurance taxes in Minnesota. Approximately 95 percent of Minnesota businesses participate in the state's unemployment insurance program, which is the basis for employment and wage data. However, individuals who are employed outside Minnesota, who are self-employed, who are employed by the federal government, who entered military service, and who are employed by an employer that did not report wages to the state of Minnesota are excluded from the employment and earnings data.

In a given quarter a graduate who worked at least 10 hours and earned $6 an hour or more was considered employed. Any graduate who met those criteria in at least one quarter was considered employed in that year. Analyses of employment data conducted by the Minnesota Department of Employment and Economic Development consider individuals to be employed only if they earned a wage of $6 per hour or higher. In 2014 the minimum wage was raised to $6.50 an hour for small companies. Because Minnesota's minimum wage law applies to all workers, even workers who receive tips must be paid the minimum wage regardless of the tips they receive (Minnesota Department of Labor and Industry, n.d.). However, to be conservative and consistent with the Minnesota Department of Employment and Economic Development's approach to analyzing employment data, a lower bound of $6 per hour was used.

College certificate or degree attainment. Data on high school graduates' college degree attainment came from the Minnesota Office of Higher Education for graduates who attained a college certificate or degree from a Minnesota institution and from the National Student Clearinghouse for graduates who received a college certificate or degree outside Minnesota. Records obtained from the Minnesota Office of Higher Education included an indicator for degree level (college certificate, associate's degree, or bachelor's degree or higher). Records obtained from the National Student Clearinghouse did not include the same indicator but included the degree title reported by the institution. The study team coded degree titles to create indicators for degree level aligned with the indicators provided by the Minnesota Office of Higher Education. Highest degree attained was determined for all but 394 graduates for whom degree title could not be coded with certainty (see "Missing data" section).

Employment and annual earnings. Quarterly hours worked and earnings reported by employers subject to unemployment insurance taxes in Minnesota and provided by the Minnesota Department of Employment and Economic Development were used to determine whether a graduate was employed in the sixth year following high school graduation, defined as the third quarter of the fifth year following high school graduation through the second quarter of the sixth year following high school graduation. Employment was a dichotomous indicator for being employed. In a given quarter a graduate who worked at least 10 hours and earned a wage of $6 per hour or more was considered employed. Any graduate who met these criteria in at least one quarter was considered employed in that year. Annual earnings were calculated as the sum of four quarters of earnings for graduates who were considered employed based on these criteria.

Missing data. Most variables had low or zero rates of missing data (table B2). In some cases there were indeterminate values for initial postsecondary pathway and highest degree attained. For 3,793 graduates in 2008–15 and 1,006 graduates in 2008–10 for whom the data indicated enrollment in a postsecondary institution, the level of that institution could not be determined from the available data. In these cases the study team replaced the unknown values with the modal value for initial postsecondary pathway (four-year college). For 394 graduates the data indicated that a college degree had been attained, but the type of degree could not be determined from the available data. In these cases the study team replaced the unknown values with the modal value for college certificate or degree attainment (bachelor's degree or higher). Finally, high school rurality could not be determined for 313 graduates in 2008–15 and for 1 graduate in 2008–10. The study team replaced the unknown value with the modal value for locale (nonrural).

Methods of data analysis

All research questions were analyzed using descriptive statistics. For research question 1 cross-tabular descriptive statistics were calculated to report the percentages of graduates

Table B2. Rates of missing data for characteristics of the population samples

Characteristic	2008–15 Minnesota high school graduates (*N* = 470,043)		2008–10 Minnesota high school graduates (*N* = 179,831)	
	Number of valid cases	Percent missing	Number of valid cases	Percent missing
Gender	470,043	0.0	179,831	0.0
Race/ethnicity	470,043	0.0	179,831	0.0
Socioeconomic status	470,043	0.0	179,831	0.0
English proficiency	470,043	0.0	179,831	0.0
Disability status	470,043	0.0	179,831	0.0
High school rurality	469,730	0.1	179,830	0.0
Initial postsecondary pathway	466,250	0.8	178,825	0.6
College certificate or degree attainment	na	na	179,437	0.2
Employment	na	na	179,831	0.0
Annual earnings	na	na	179,831	0.0

na is not applicable because these outcomes were not assessed for the 2008–15 cohort.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

that followed each of six initial postsecondary pathways and the characteristics of those graduates.

For research question 2 cross-tabular descriptive statistics were calculated to report the percentages of high school graduates who attained a college certificate or degree and the characteristics of those graduates. These calculations were performed for all graduates and separately for four subsets of graduates: graduates who were employed but not enrolled in college within one year of high school graduation, graduates who enrolled in a less-than-four-year college within one year of high school graduation, graduates who enrolled in a four-year college within one year of high school graduation, and graduates who were not employed or enrolled in college within one year of high school graduation.

For research question 3 cross-tabular descriptive statistics were calculated to report the employment rates and annual earnings for graduates six years after high school graduation and the characteristics of those graduates. These calculations were performed for all graduates and separately for the four subsets of graduates considered for research question 2.

Appendix C. Supplemental findings

This appendix presents more detailed results of analyses for research questions 2 and 3.

Differences in college certificate and degree attainment by student characteristics for high school graduates who followed the same initial postsecondary pathway

Research question 2 asks about differences in college certificate and degree attainment six years after high school graduation by student gender, race/ethnicity, socioeconomic status, English proficiency, and disability status and by high school rurality among graduates who followed each initial postsecondary pathway. For each characteristic the percentages of 2008–10 Minnesota public high school graduates in each subgroup who attained a college certificate or degree six years after high school graduation are provided by initial postsecondary pathway.

Gender. Among high school graduates who enrolled in a less-than-four-year college within one year of high school graduation, female and male graduates attained an associate's degree at a similar rate, but female graduates were more likely than male graduates to attain a college certificate (12 percent versus 7 percent). Among graduates who enrolled in a four-year college within one year of high school graduation, female graduates were more likely than male graduates to attain a bachelor's degree or higher (74 percent versus 67 percent; table C1).

Table C1. Percentage of 2008–10 Minnesota public high school graduates attaining a college certificate or degree six years after high school graduation, by initial postsecondary pathway and gender

Initial postsecondary pathway and gender	Number	No college certificate or degree	College certificate	Associate's degree	Bachelor's degree or higher
All graduates					
Female	89,864	40.6	5.8	11.5	42.1
Male	89,967	55.4	3.0	10.6	31.0
Employed, no college					
Female	13,182	83.0	7.2	6.1	3.8
Male	17,841	90.0	2.6	5.0	2.5
Less-than-four-year college					
Female	24,048	46.6	12.2	26.9	14.3
Male	25,949	55.4	6.7	26.3	11.6
Four-year college					
Female	45,781	17.8	2.5	6.2	73.5
Male	36,213	28.1	0.9	4.3	66.7
Not employed, no college[a]					
Female	6,853	90.1	3.2	2.8	3.9
Male	9,964	93.0	1.4	2.8	2.8

Note: Percentages may not sum to 100 percent because of rounding. Differences of greater than 5 percentage points are considered substantively meaningful.

a. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Race/ethnicity. Among high school graduates who enrolled in a less-than-four-year college within one year of high school graduation, college certificate attainment rates were similar for graduates of all racial/ethnic minority groups, but White and Asian graduates were more likely than graduates from other racial/ethnic groups to attain an associate's degree. About 29 percent of White graduates and 24 percent of Asian graduates attained an associate's degree compared with 19 percent of Hispanic graduates, 17 percent of American Indian graduates, and 12 percent of Black graduates (table C2). Among graduates who enrolled in a four-year college within one year of high school graduation, White and Asian graduates attained a bachelor's degree or higher at higher rates than graduates from other racial/ethnic groups. The percentage of high school graduates who attained a bachelor's degree or higher was 72 percent among White graduates and 66 percent among Asian graduates compared with 56 percent among Hispanic graduates, 48 percent among Black graduates, and 47 percent among American Indian graduates.

Table C2. Percentage of 2008–10 Minnesota public high school graduates attaining a college certificate or degree six years after high school graduation, by initial postsecondary pathway and race/ethnicity

Initial postsecondary pathway and race/ethnicity	Number	No college certificate or degree	College certificate	Associate's degree	Bachelor's degree or higher
All graduates					
American Indian/Alaska Native	2,735	77.5	4.1	7.2	11.2
Asian/Pacific Islander	10,074	53.6	4.6	9.8	32.0
Black, non-Hispanic	11,731	71.8	5.4	6.3	16.5
Hispanic/Latino	5,955	72.2	4.4	8.3	15.1
White, non-Hispanic	149,336	44.3	4.3	11.7	39.8
Employed, no college					
American Indian/Alaska Native	887	92.2	3.2	4.1	0.6
Asian/Pacific Islander	1,670	88.4	4.3	5.0	2.3
Black, non-Hispanic	2,381	91.7	4.6	2.5	1.1
Hispanic/Latino	1,412	89.9	3.8	4.6	1.8
White, non-Hispanic	24,673	86.1	4.7	5.8	3.4
Less-than-four-year college					
American Indian/Alaska Native	722	68.8	7.9	17.2	6.1
Asian/Pacific Islander	2,907	55.4	9.2	24.1	11.4
Black, non-Hispanic	4,386	71.8	8.6	12.1	7.4
Hispanic/Latino	1,759	64.2	8.9	19.2	7.7
White, non-Hispanic	40,223	47.8	9.5	28.8	14.0
Four-year college					
American Indian/Alaska Native	546	46.3	2.4	4.6	46.7
Asian/Pacific Islander	4,263	28.1	2.2	3.9	65.8
Black, non-Hispanic	3,245	45.1	3.3	3.5	48.1
Hispanic/Latino	1,280	37.5	2.0	4.5	55.9
White, non-Hispanic	72,660	20.5	1.7	5.6	72.2
Not employed, no college[a]					
American Indian/Alaska Native	580	95.0	2.2	2.2	0.5
Asian/Pacific Islander	1,234	90.2	2.4	3.1	4.3
Black, non-Hispanic	1,719	94.8	2.4	1.8	1.1

(continued)

Table C2. Percentage of 2008–10 Minnesota public high school graduates attaining a college certificate or degree six years after high school graduation, by initial postsecondary pathway and race/ethnicity *(continued)*

Initial postsecondary pathway and race/ethnicity	Number	No college certificate or degree	College certificate	Associate's degree	Bachelor's degree or higher
Hispanic/Latino	1,504	94.6	1.8	2.1	1.6
White, non-Hispanic	11,780	91.1	2.1	3.1	3.8

Note: Percentages may not sum to 100 percent because of rounding. Differences of greater than 5 percentage points are considered substantively meaningful.

a. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Socioeconomic status. Among high school graduates who enrolled in a less-than-four-year college within one year of high school graduation, economically disadvantaged graduates attained an associate's degree at a lower rate (22 percent) than graduates who were not economically disadvantaged (29 percent; table C3). Similarly, among graduates who enrolled in a four-year college, economically disadvantaged graduates attained a bachelor's degree or higher at a lower rate (53 percent) than graduates who were not economically disadvantaged (74 percent).

Table C3. Percentage of 2008–10 Minnesota public high school graduates attaining a college certificate or degree six years after high school graduation, by initial postsecondary pathway and socioeconomic status

Initial postsecondary pathway and socioeconomic status	Number	No college certificate or degree	College certificate	Associate's degree	Bachelor's degree or higher
All graduates					
Economically disadvantaged	55,602	68.0	5.4	10.5	16.2
Not economically disadvantaged	124,229	39.1	4.0	11.3	45.7
Employed, no college					
Economically disadvantaged	15,244	89.8	4.4	4.5	1.3
Not economically disadvantaged	15,779	84.3	4.7	6.3	4.7
Less-than-four-year college					
Economically disadvantaged	18,169	59.7	9.7	22.1	8.5
Not economically disadvantaged	31,828	46.3	9.1	29.1	15.5
Four-year college					
Economically disadvantaged	13,486	37.4	2.8	6.8	53.0
Not economically disadvantaged	68,508	19.4	1.6	5.1	74.0

(continued)

Table C3. Percentage of 2008–10 Minnesota public high school graduates attaining a college certificate or degree six years after high school graduation, by initial postsecondary pathway and socioeconomic status *(continued)*

Not employed, no college[a]					
Economically disadvantaged	8,703	94.3	2.2	2.3	1.3
Not economically disadvantaged	8,114	89.2	2.0	3.4	5.4

Note: Percentages may not sum to 100 percent because of rounding. Socioeconomic status is determined by eligibility for the national school lunch program, a proxy for economic disadvantage. Differences of greater than 5 percentage points are considered substantively meaningful.

a. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

English proficiency. Among high school graduates who enrolled in a less-than-four-year college within one year of high school graduation, graduates with limited English proficiency were less likely to attain an associate's degree (19 percent) than graduates who were English proficient (27 percent; table C4). In addition, graduates with limited English proficiency were less likely to attain a bachelor's degree or higher (7 percent) than graduates

Table C4. Percentage of 2008–10 Minnesota public high school graduates attaining a college certificate or degree six years after high school graduation, by initial postsecondary pathway and English proficiency

Initial postsecondary pathway and English proficiency	Number	No college certificate or degree	College certificate	Associate's degree	Bachelor's degree or higher
All graduates					
Limited proficiency	3,945	75.4	6.6	8.8	9.3
Proficient	175,886	47.4	4.4	11.1	37.2
Employed, no college					
Limited proficiency	855	92.9	4.4	2.0	0.7
Proficient	30,168	86.8	4.6	5.5	3.1
Less-than-four-year college					
Limited proficiency	1,550	61.6	11.9	19.2	7.3
Proficient	48,447	50.9	9.3	26.8	13.1
Four-year college					
Limited proficiency	500	46.2	4.4	2.8	46.6
Proficient	81,494	22.2	1.8	5.4	70.6
Not employed, no college[a]					
Limited proficiency	1,040	95.7	1.5	1.5	1.3
Proficient	15,777	91.6	2.1	2.9	3.4

Note: Percentages may not sum to 100 percent because of rounding. English proficiency is defined by qualifying for English language services at the time of high school graduation (limited proficiency) or not qualifying (proficient). Differences of greater than 5 percentage points are considered substantively meaningful.

a. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

who were English proficient (13 percent). High school graduates with limited English proficiency who enrolled in a four-year college within one year of high school graduation were less likely to attain a bachelor's degree or higher (47 percent) than graduates who were English proficient (71 percent).

Disability status. Among high school graduates who followed the same initial postsecondary pathway, graduates with disabilities continued to have much lower rates of degree attainment than graduates without disabilities. Among graduates who enrolled in a less-than-four-year college, 18 percent of graduates with disabilities attained an associate's degree compared with 28 percent of graduates without disabilities (table C5). Among graduates who enrolled in a four-year college, 39 percent of graduates with disabilities attained a bachelor's degree or higher compared with 71 percent of graduates without disabilities.

High school rurality. Overall, there were few differences in college certificate and degree attainment rates six years after high school graduation among graduates who attended rural and those who attended nonrural high schools (see table 3 in the main text). This finding remained when graduates who followed the same initial postsecondary pathway were compared, with one exception. Among graduates who enrolled in a less-than-four-year college within one year of high school graduation, graduates who attended rural high schools were more likely to attain an associate's degree (31 percent) than graduates who attended nonrural high schools (24 percent; table C6).

Table C5. Percentage of 2008–10 Minnesota public high school graduates attaining a college certificate or degree six years after high school graduation, by initial postsecondary pathway and disability status

Initial postsecondary pathway and disability status	Number	No college certificate or degree	College certificate	Associate's degree	Bachelor's degree or higher
All graduates					
With disabilities	18,092	82.1	5.1	7.5	5.3
Without disabilities	161,739	44.2	4.3	11.4	40.1
Employed, no college					
With disabilities	5,935	94.4	2.9	2.2	0.5
Without disabilities	25,088	85.2	4.9	6.2	3.6
Less-than-four-year college					
With disabilities	5,602	65.1	10.9	18.4	5.5
Without disabilities	44,395	49.4	9.1	27.6	13.9
Four-year college					
With disabilities	1,518	47.2	4.8	9.0	39.0
Without disabilities	80,476	21.9	1.8	5.3	71.1
Not employed, no college[a]					
With disabilities	5,037	97.0	1.3	1.2	0.5
Without disabilities	11,780	89.6	2.5	3.5	4.4

Note: Percentages may not sum to 100 percent because of rounding. Differences of greater than 5 percentage points are considered substantively meaningful.

a. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Table C6. Percentage of 2008–10 Minnesota public high school graduates attaining a college certificate or degree six years after high school graduation, by initial postsecondary pathway and high school rurality

Initial postsecondary pathway and high school rurality	Number	No college certificate or degree	College certificate	Associate's degree	Bachelor's degree or higher
All graduates					
Rural high school	57,040	46.7	4.7	13.6	34.9
Nonrural high school	122,791	48.6	4.3	9.8	37.3
Employed, no college					
Rural high school	9,966	86.4	4.4	6.4	2.8
Nonrural high school	21,057	87.3	4.6	5.0	3.1
Less-than-four-year college					
Rural high school	16,770	45.5	10.3	31.4	12.8
Nonrural high school	33,227	54.1	8.9	24.1	13.0
Four-year college					
Rural high school	25,162	22.5	1.8	6.8	68.9
Nonrural high school	56,832	22.2	1.8	4.7	71.2
Not employed, no college[a]					
Rural high school	5,142	92.4	1.8	2.9	2.9
Nonrural high school	11,675	91.6	2.2	2.8	3.4

Note: Percentages may not sum to 100 percent because of rounding. Differences of greater than 5 percentage points are considered substantively meaningful.

a. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Differences in employment rates and median annual earnings by student characteristics among graduates who followed the same initial postsecondary pathway

Research question 3 asks about differences in employment rates and annual earnings six years after high school graduation by student gender, race/ethnicity, socioeconomic status, English proficiency, and disability status and by high school rurality among graduates who followed each initial postsecondary pathway. For each characteristic the percentages of 2008–10 Minnesota public high school graduates in each subgroup who were employed six years after high school graduation and their median annual earnings are provided by initial postsecondary pathway.

Gender. Among high school graduates who followed the same initial postsecondary pathway, there were no substantively meaningful differences in employment rates six years after high school graduation. However, differences in annual earnings by gender remained for all but one initial postsecondary pathway. Male graduates who transitioned to employment only within one year of graduation had higher earnings ($23,335) than female graduates ($17,794; table C7). Male graduates who enrolled in a less-than-four-year college within one year of graduation had higher earnings ($24,633) than female graduates ($21,197). And male graduates who were neither employed nor enrolled in college within one year of graduation had higher earnings ($15,425) than female graduates ($12,718).

Table C7. Percentage of 2008–10 Minnesota public high school graduates who were employed six years after high school graduation and their annual earnings, by initial postsecondary pathway and gender

Initial postsecondary pathway and gender	Total number	Graduates who were employed		Annual earnings[a]		
		Number	Percent[b]	Median	25th percentile[c]	75th percentile[c]
All graduates						
Female	89,864	64,566	71.9	$21,693	$10,998	$32,652
Male	89,967	63,675	70.8	$23,957	$11,611	$37,599
Employed, no college						
Female	13,182	10,122	76.8	$17,794	$9,072	$26,357
Male	17,841	13,998	78.5	$23,335	$11,814	$34,831
Less-than-four-year college						
Female	24,048	19,479	81.0	$21,197	$11,969	$30,030
Male	25,949	20,468	78.9	$24,633	$12,857	$37,480
Four-year college						
Female	45,781	32,386	70.7	$24,843	$12,042	$37,177
Male	36,213	25,034	69.1	$25,678	$11,763	$41,516
Not employed, no college[d]						
Female	6,853	2,579	37.6	$12,718	$5,184	$21,416
Male	9,964	4,175	41.9	$15,425	$6,059	$26,581

a. Earnings are for graduates who were employed and had nonzero earnings in at least one quarter of the year. Differences of greater than 5 percent are considered substantively meaningful.

b. Differences of greater than 5 percentage points are considered substantively meaningful.

c. Percentile refers to the percentage of graduates who earned at or below the values indicated. For example, six years after high school graduation, 25 percent of female graduates earned $10,998 or less, and 75 percent earned $32,652 or less. Put differently, half of all employed female graduates earned between $10,998 and $32,652 six years after high school graduation.

d. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Race/ethnicity. Differences in employment rates widened among graduates from different racial/ethnic groups who followed the same initial postsecondary pathway. Among graduates who were employed but not enrolled in college within one year of high school graduation, American Indian graduates had a lower employment rate six years after high school graduation (76 percent) than Asian graduates (82 percent; table C8). Similarly, among graduates who enrolled in a less-than-four-year college within one year of graduation, American Indian graduates had a lower employment rate six years after high school graduation (76 percent) than Asian graduates (83 percent). Among graduates who enrolled in a four-year college within one year of graduation, American Indian graduates had a lower employment rate six years after high school graduation (67 percent) than Black graduates (74 percent). Finally, among graduates who were not employed or enrolled in college within one year of graduation, Hispanic graduates had a lower employment rate six years after high school graduation (34 percent) than American Indian graduates (46 percent), Asian graduates (40 percent), Black graduates (45 percent), and White graduates (40 percent).

Table C8. Percentage of 2008–10 Minnesota public high school graduates who were employed six years after high school graduation and their annual earnings, by initial postsecondary pathway and race/ethnicity

Initial postsecondary pathway and race/ethnicity	Total number	Graduates who were employed		Annual earnings[a]		
		Number	Percent[b]	Median	25th percentile[c]	75th percentile[c]
All graduates						
American Indian/Alaska Native	2,735	1,848	67.6	$16,370	$6,864	$26,357
Asian/Pacific Islander	10,074	7,296	72.4	$22,858	$12,018	$32,665
Black, non-Hispanic	11,731	8,385	71.5	$17,141	$7,570	$27,568
Hispanic/Latino	5,955	3,900	65.5	$21,153	$11,108	$31,100
White, non-Hispanic	149,336	106,812	71.5	$23,403	$11,752	$35,946
Employed, no college						
American Indian/Alaska Native	887	671	75.7	$16,197	$6,760	$24,524
Asian/Pacific Islander	1,670	1,369	82.0	$23,491	$12,943	$32,018
Black, non-Hispanic	2,381	1,855	77.9	$15,571	$6,851	$25,766
Hispanic/Latino	1,412	1,109	78.5	$20,383	$11,430	$30,754
White, non-Hispanic	24,673	19,116	77.5	$21,003	$10,940	$31,940
Less-than-four-year college						
American Indian/Alaska Native	722	548	75.9	$18,470	$9,239	$28,163
Asian/Pacific Islander	2,907	2,402	82.6	$22,946	$12,656	$31,448
Black, non-Hispanic	4,386	3,376	77.0	$17,682	$8,315	$27,759
Hispanic/Latino	1,759	1,384	78.7	$21,448	$11,551	$30,903
White, non-Hispanic	40,223	32,237	80.1	$23,368	$12,938	$34,471
Four-year college						
American Indian/Alaska Native	546	363	66.5	$19,418	$7,719	$32,429
Asian/Pacific Islander	4,263	3,026	71.0	$23,397	$11,606	$35,380
Black, non-Hispanic	3,245	2,388	73.6	$19,758	$9,136	$30,666
Hispanic/Latino	1,280	892	69.7	$23,647	$12,393	$35,183
White, non-Hispanic	72,660	50,751	69.8	$25,733	$12,138	$39,537
Not employed, no college[d]						
American Indian/Alaska Native	580	266	45.9	$9,929	$3,122	$19,285
Asian/Pacific Islander	1,234	499	40.4	$18,079	$9,259	$26,501
Black, non-Hispanic	1,719	766	44.6	$10,509	$3,204	$19,889
Hispanic/Latino	1,504	515	34.2	$18,004	$8,065	$26,868
White, non-Hispanic	11,780	4,708	40.0	$14,358	$5,988	$24,724

a. Earnings are for graduates who were employed and had nonzero earnings in at least one quarter of the year. Differences of greater than 5 percent are considered substantively meaningful.

b. Differences of greater than 5 percentage points are considered substantively meaningful.

c. Percentile refers to the percentage of graduates who earned at or below the values indicated. For example, six years after high school graduation, 25 percent of all employed American Indian/Alaska Native graduates earned $6,864 or less, and 75 percent earned $26,357 or less. Put differently, half of all employed American Indian/Alaska Native graduates earned between $6,864 and $26,357 six years after high school graduation.

d. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Differences in earnings also remained among graduates from different racial/ethnic groups who followed the same initial postsecondary pathway, with American Indian, Black, and Hispanic graduates earning less than Asian and White graduates, with one exception. Among graduates who were not employed or enrolled in college within one year of graduation, White graduates had lower earnings six years after high school graduation ($14,358) than Hispanic graduates ($18,004; see table C8).

Socioeconomic status. Employment rates six years after high school graduation were similar for economically disadvantaged graduates and graduates who were not economically disadvantaged who followed the same initial postsecondary pathway, with one exception. Among graduates who were not employed or enrolled in college, economically disadvantaged graduates had a higher employment rate six years after high school graduation (45 percent) than graduates who were not economically disadvantaged (36 percent; table C9). Differences in earnings remained between economically disadvantaged graduates and graduates who were not economically disadvantaged who followed the same initial postsecondary pathway, with economically disadvantaged graduates earning less among graduates who followed each pathway.

Table C9. Percentage of 2008–10 Minnesota public high school graduates who were employed six years after high school graduation and their annual earnings, by initial postsecondary pathway and socioeconomic status

Initial postsecondary pathway and socioeconomic status	Total number	Graduates who were employed		Annual earnings[a]		
		Number	Percent[b]	Median	25th percentile[c]	75th percentile[c]
All graduates						
Economically disadvantaged	55,602	40,033	72.0	$19,484	$9,837	$30,382
Not economically disadvantaged	124,229	88,208	71.0	$24,274	$12,116	$37,075
Employed, no college						
Economically disadvantaged	15,244	11,942	78.3	$18,926	$9,365	$29,108
Not economically disadvantaged	15,779	12,178	77.2	$22,327	$11,785	$33,215
Less-than-four-year college						
Economically disadvantaged	18,169	14,268	78.5	$20,814	$11,147	$30,910
Not economically disadvantaged	31,828	25,679	80.7	$23,837	$13,144	$34,903
Four-year college						
Economically disadvantaged	13,486	9,948	73.8	$22,405	$11,239	$33,780
Not economically disadvantaged	68,508	47,472	69.3	$25,939	$12,069	$39,975
Not employed, no college[d]						
Economically disadvantaged	8,703	3,875	44.5	$12,268	$4,976	$23,031
Not economically disadvantaged	8,114	2,879	35.5	$15,558	$6,678	$26,137

a. Earnings are for graduates who were employed and had nonzero earnings in at least one quarter of the year. Differences of greater than 5 percent are considered substantively meaningful.

b. Differences of greater than 5 percentage points are considered substantively meaningful.

c. Percentile refers to the percentage of graduates who earned at or below the values indicated. For example, six years after high school graduation, 25 percent of all employed economically disadvantaged graduates earned $9,837 or less, and 75 percent earned $30,382 or less. Put differently, half of all employed economically disadvantaged graduates earned between $9,837 and $30,382 six years after high school graduation.

d. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

English proficiency. Differences in employment rates by English proficiency were smaller among high school graduates who followed the same initial postsecondary pathway than across all pathways, with one exception. Among graduates who were not employed or enrolled in college, 32 percent of graduates with limited English proficiency were employed six years after high school graduation compared with 41 percent of graduates who were English proficient (table C10).

The pattern was less clear for annual earnings. Among graduates who followed the same initial postsecondary pathway, the difference in annual earnings between graduates with limited English proficiency and graduates who were English proficient became larger or changed direction. For example, among graduates who were not employed or enrolled in college, graduates with limited English proficiency had higher annual earnings ($18,004) than graduates who were English proficient ($13,934; see table C10).

Table C10. Percentage of 2008–10 Minnesota public high school graduates who were employed six years after high school graduation and their annual earnings, by initial postsecondary pathway and English proficiency

Initial postsecondary pathway and English proficiency	Total number	Graduates who were employed		Annual earnings[a]		
		Number	Percent[b]	Median	25th percentile[c]	75th percentile[c]
All graduates						
Limited proficiency	3,945	2,509	63.6	$20,944	$10,320	$30,436
Proficient	175,886	125,732	71.5	$22,754	$11,299	$35,056
Employed, no college						
Limited proficiency	855	644	75.3	$22,932	$12,390	$31,348
Proficient	30,168	23,476	77.8	$20,478	$10,514	$31,261
Less-than-four-year college						
Limited proficiency	1,550	1,162	74.5	$20,543	$10,053	$30,334
Proficient	48,447	38,785	80.0	$22,785	$12,448	$33,533
Four-year college						
Limited proficiency	500	372	74.4	$20,715	$10,379	$31,352
Proficient	81,494	57,048	70.0	$25,214	$11,925	$38,952
Not employed, no college[d]						
Limited proficiency	1,040	331	31.8	$18,004	$8,770	$26,968
Proficient	15,777	6,423	40.7	$13,934	$5,618	$24,142

a. Earnings are for graduates who were employed and had nonzero earnings in at least one quarter of the year. Differences of greater than 5 percent are considered substantively meaningful.

b. Differences of greater than 5 percentage points are considered substantively meaningful.

c. Percentile refers to the percentage of graduates who earned at or below the values indicated. For example, six years after high school graduation, 25 percent of all employed graduates with limited English proficiency earned $10,320 or less, and 75 percent earned $30,436 or less. Put differently, half of all employed graduates with limited English proficiency earned between $10,320 and $30,436 six years after high school graduation.

d. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Disability status. Among high school graduates who followed the same initial postsecondary pathway, differences in employment rates by disability status became smaller or were eliminated for each pathway (table C11). Among graduates who followed the same initial postsecondary pathway, differences in annual earnings between graduates with disabilities and graduates without disabilities became smaller for all pathways except the four-year college enrollment pathway. For that pathway the difference in annual earnings became larger between graduates who had disabilities ($17,141) and graduates who did not ($25,409).

Table C11. Percentage of 2008–10 Minnesota public high school graduates who were employed six years after high school graduation and their annual earnings, by initial postsecondary pathway and disability status

Initial postsecondary pathway and disability status	Total number	Graduates who were employed		Annual earnings[a]		
		Number	Percent[b]	Median	25th percentile[c]	75th percentile[c]
All graduates						
With disabilities	18,092	11,947	66.0	$16,482	$7,269	$26,903
Without disabilities	161,739	116,294	71.9	$23,443	$11,884	$35,642
Employed, no college						
With disabilities	5,935	4,647	78.3	$17,193	$7,757	$27,449
Without disabilities	25,088	19,473	77.6	$21,348	$11,284	$32,063
Less-than-four-year college						
With disabilities	5,602	4,348	77.6	$18,595	$9,368	$29,593
Without disabilities	44,395	35,599	80.2	$23,242	$12,801	$33,879
Four-year college						
With disabilities	1,518	1,065	70.2	$17,141	$7,551	$27,482
Without disabilities	80,476	56,355	70.0	$25,409	$12,037	$39,053
Not employed, no college[d]						
With disabilities	5,037	1,887	37.5	$9,905	$3,309	$19,109
Without disabilities	11,780	4,867	41.3	$16,034	$6,942	$26,110

a. Earnings are for graduates who were employed and had nonzero earnings in at least one quarter of the year. Differences of greater than 5 percent are considered substantively meaningful.

b. Differences of greater than 5 percentage points are considered substantively meaningful.

c. Percentile refers to the percentage of graduates who earned at or below the values indicated. For example, six years after high school graduation, 25 percent of all employed graduates with disabilities earned $7,269 or less, and 75 percent earned $26,903 or less. Put differently, half of all employed graduates with disabilities earned between $7,269 and $26,903 six years after high school graduation.

d. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

High school rurality. Employment rates and annual earnings six years after high school graduation were similar for graduates of rural high schools and graduates of nonrural high schools, with one exception. Among graduates who enrolled in a less-than-four-year college within one year of graduation, graduates of nonrural high schools had lower earnings six years later ($22,109) than graduates of rural high schools ($24,041; table C12).

Table C12. Percentage of 2008–10 Minnesota public high school graduates who were employed six years after high school graduation and their annual earnings, by initial postsecondary pathway and high school rurality

Initial postsecondary pathway and high school rurality	Total number	Graduates who were employed		Annual earnings[a]		
		Number	Percent[b]	Median	25th percentile[c]	75th percentile[c]
All graduates						
Rural high school	57,040	40,153	70.4	$23,572	$11,879	$36,082
Nonrural high school	122,791	88,088	71.7	$22,315	$11,053	$34,409
Employed, no college						
Rural high school	9,966	7,584	76.1	$20,850	$10,592	$31,805
Nonrural high school	21,057	16,536	78.5	$20,436	$10,530	$31,007
Less-than-four-year college						
Rural high school	16,770	13,133	78.3	$24,041	$13,289	$35,561
Nonrural high school	33,227	26,814	80.7	$22,109	$12,016	$32,465
Four-year college						
Rural high school	25,162	17,524	69.6	$25,759	$12,581	$39,244
Nonrural high school	56,832	39,896	70.2	$24,910	$11,653	$38,737
Not employed, no college[d]						
Rural high school	5,142	1,912	37.2	$14,187	$5,314	$25,149
Nonrural high school	11,675	4,842	41.5	$14,102	$5,888	$24,028

a. Earnings are for graduates who were employed and had nonzero earnings in at least one quarter of the year. Differences of greater than 5 percent are considered substantively meaningful.

b. Differences of greater than 5 percentage points are considered substantively meaningful.

c. Percentile refers to the percentage of graduates who earned at or below the values indicated. For example, six years after high school graduation, 25 percent of all employed graduates of rural high schools earned $11,879 or less, and 75 percent earned $36,082 or less. Put differently, half of all employed graduates of rural high schools earned between $11,879 and $36,082 six years after high school graduation.

d. Includes graduates who were not employed or enrolled in college within one year of high school graduation, who were employed outside Minnesota, who were self-employed, who entered military service, or who were employed by an employer that did not report wages to the state of Minnesota.

Source: Authors' analysis based on data from the Minnesota Statewide Longitudinal Education Data System.

Notes

1. Graduates who were considered not employed or enrolled in college may have been employed outside Minnesota, self-employed, serving in the military, or employed by employers who did not report wages to the federal government.
2. American Indian includes Alaska Native; Asian includes Native Hawaiian and Other Pacific Islander; Hispanic includes Latino; and Black includes African American.
3. All reported median earnings are for graduates who were employed and had nonzero earnings in at least one quarter of the year.
4. Graduates who attained a bachelor's degree or higher may be enrolled in graduate school six years after high school graduation, potentially accounting for their lower employment rates.
5. McFarland et al. (2017) categorize low income as the lowest 20 percent of the family income distribution, middle income as the middle 20–80 percent, and high income as the top 20 percent.
6. These statistics are not directly comparable to other statistics presented in this literature review because they do not refer to high school graduates who made an immediate transition to postsecondary education. Data on youth with disabilities refer to a nationally representative sample of youth who were out of secondary school and between the ages of 15 and 19 in 2001, while data on youth in the general population are drawn from the National Longitudinal Survey of Youth 1997 (Newman et al., 2009).

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