Stated Briefly

Characteristics and postsecondary pathways of students who participate in acceleration programs in Minnesota

Elisabeth Davis
Cameron Smither
Bo Zhu
Erin Roth
Jennifer Stephan
Shandu Foster
American Institutes for Research

In collaboration with the Midwest College and Career Success Research Alliance

Acceleration programs are challenging courses in which high school students can simultaneously earn credit toward a high school diploma and a college degree (dual credit). This study examined participation rates in acceleration programs and early college outcomes for the 2011 cohort of Minnesota high school graduates. Nearly half the graduates participated in at least one acceleration program during high school, and about half the participants who enrolled in a Minnesota college were awarded at least one dual credit. The majority of participants in acceleration programs who were awarded dual credit received it from a selective or very selective four-year college. Racial/ethnic minority students and students eligible for the federal school lunch program participated in acceleration programs and were awarded credit by the Minnesota college in which they enrolled at lower rates relative to their peers. Participation in acceleration programs was associated with college enrollment and, regardless of the number of credits awarded by the college, with college readiness and persistence.

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Why this study?

In Minnesota and other states many high school students have the opportunity to take advanced courses that allow them to simultaneously earn high school and college credit (dual credit). In Minnesota these programs include Advanced Placement courses, concurrent-enrollment courses, Postsecondary Enrollment Options courses (a dual-enrollment program offered in Minnesota), International Baccalaureate courses, and others. Thousands of high school students in Minnesota participate in acceleration programs each year; 9 percent of 2010 high school graduates who enrolled in a Minnesota college in fall 2010 had earned enough credits (about 30) to have a college class standing of sophomore or higher upon admission (Minnesota Office of Higher Education, n.d. a).[1] However, less is known about relationships between participation in different types of acceleration programs and the rates at which credits are awarded by Minnesota colleges.

Individual postsecondary institutions may establish their own eligibility requirements for their dual-enrollment courses. The Minnesota State Colleges and Universities Board of Trustees has established eligibility requirements (minimum class rank and college admissions examination scores) for dual-enrollment courses for its 34 community and technical colleges and state universities. Some colleges have more stringent criteria. For example, the University of Minnesota–Twin Cities requires a minimum grade point average of 3.3 and two writing samples and considers advanced coursework in addition to scores on college entrance examinations (University of Minnesota, n.d.).

Although acceleration programs are a central part of Minnesota's strategy for improving college readiness, little information exists on the accessibility of such programs or on the postsecondary pathways of participants. Minnesota members of the Midwest College and Career Success Research Alliance wanted to know more about these and other characteristics of acceleration programs in the state. Specifically, they collaborated with Regional Educational Laboratory Midwest to conduct a study that answers five research questions:

- What proportion of 2011 high school graduates participated in acceleration programs and were awarded credits by the Minnesota two- and four-year college in which they enrolled?
- What were the characteristics of the students and schools that participated in acceleration programs and of the students who were awarded credit in these programs?
- What were the characteristics of colleges that awarded credit to participants in acceleration programs who enrolled in their institutions?
- Was participation in acceleration programs associated with college enrollment, college readiness, or persistence to the second year of college?
- Do the associations between participation in acceleration programs and college enrollment, college readiness, and college persistence remain the same after other student- and school-level characteristics are controlled for?

The study team used data from the Minnesota Statewide Longitudinal Education Data System provided by the Minnesota Office of Higher Education. The study team calculated descriptive statistics to answer the questions; thus the study cannot determine the effect of acceleration programs on students' postsecondary outcomes. See box 1 for a summary of the data and methods used for the study.

What the study found

Forty-eight percent of 2011 Minnesota high school graduates participated in acceleration programs; participation rates varied by program type and student characteristics. Among participants, enrollment in selective and very selective colleges was overrepresented, and enrollment in two-year colleges was underrepresented.

Box 1. Data and methods

The study team collected deidentified student-level data from the Minnesota Statewide Longitudinal Education Data System. The population for this study consisted of all Minnesota public high school students who graduated in 2011 (n = 59,499). This cohort can be followed in the state longitudinal data system for two years after high school graduation (through spring 2013).

The study examined participation in five acceleration programs: Advanced Placement courses (measured by whether students sat for an Advanced Placement examination), concurrent-enrollment courses, Postsecondary Enrollment Options courses, other/unknown program participation (such as private college high school vouchers and one-to-one articulation agreements between districts and colleges that are not regulated by the state or classified in the database by participating high schools), and International Baccalaureate courses (measured by whether students sat for an International Baccalaureate examination). Because dual credits are not awarded by colleges until students enroll, data for credits awarded at the college level were available only for students who enrolled in a Minnesota college (including institutions offering less than two-year, two-year, and four-year programs) within two years of high school graduation.

In addition to student participation and credits awarded at the college level, the study team collected and analyzed the following variables:

- *Student characteristics.* Data included gender, race/ethnicity, eligibility for the federal school lunch program (a proxy for economic disadvantage), ACT scores, and math and reading scores on the Minnesota Comprehensive Assessment.
- *High school characteristics.* Data included school urbanicity (rural or nonrural) and school size (small, medium, or large, defined by splitting the distribution of total school enrollment into thirds).
- *Characteristics of dual credit–awarding colleges.* Data included two categories of college type (less than two- and two-year colleges, and four-year colleges) and selectivity ranking (nonselective two-year colleges and less selective, selective, and very selective four-year colleges; based on rankings in Barron's Educational Series, 2010).
- *Postsecondary measures.* Data included student-level measures of enrollment in a Minnesota college (all certificate- and degree-granting institutions offering less than two-year, two-year, and four-year programs) in fall 2011, enrollment in only a four-year Minnesota college in fall 2011, enrollment in a Minnesota college within two years of high school graduation, taking only nonremedial courses in a student's first semester, and persistence to the second year of college. Minnesota State Longitudinal Education Data System data were supplemented by data from the National Student Clearinghouse to capture students who transferred out of Minnesota for their second year of college.

The study team calculated descriptive statistics and developed and analyzed hierarchical logistic regression models. The models controlled for student and high school characteristics. Separate results were produced for each postsecondary outcome measure.

Participation was positively associated with college enrollment, college readiness, and persistence to the second year of college.

Almost half of the 2011 cohort of Minnesota high school graduates participated in at least one acceleration program during high school

Forty-eight percent of 2011 Minnesota high school graduates participated in at least one acceleration program during high school. A more detailed look at participants revealed:

- Rates of participation among the programs varied. Advanced Placement courses had the highest participation rate (26 percent), followed by concurrent-enrollment courses (19 percent) and Postsecondary Enrollment Options courses (7 percent).

- Eleven percent of graduates participated in more than one acceleration program; however, 24 percent of participants participated in more than one type of program during high school.
- Fifty-five percent of graduates who enrolled in a Minnesota college within two years of high school graduation participated in acceleration programs during high school (figure 1).

About half of participants in acceleration programs who enrolled in a Minnesota college were awarded at least one dual credit, but the rate varied by program

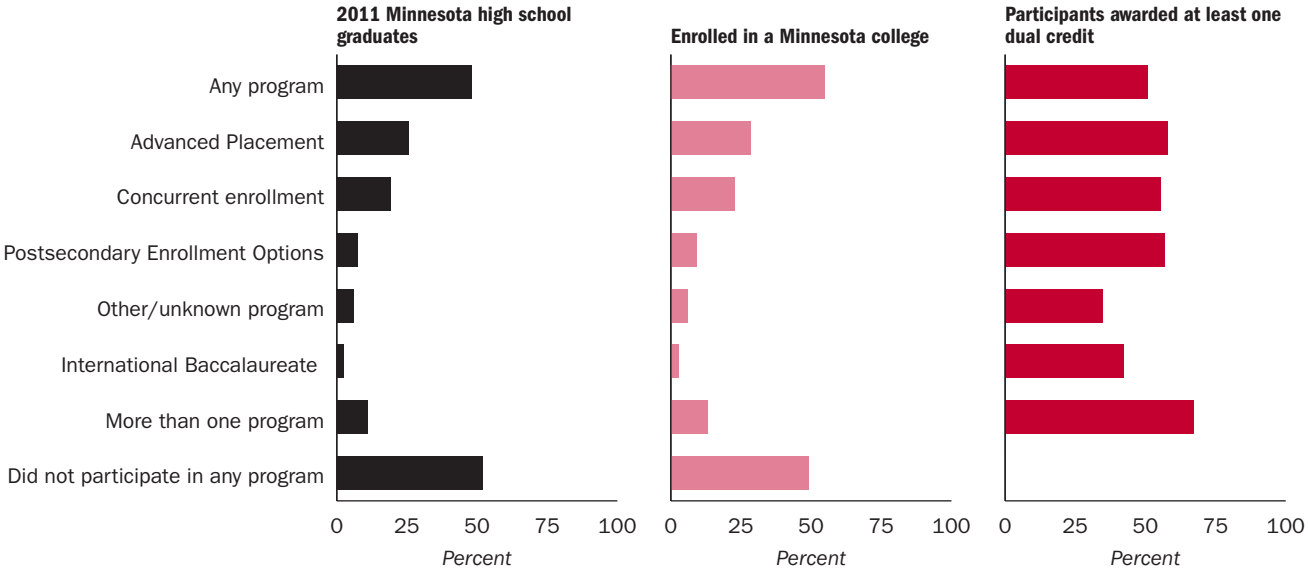
Fifty-one percent of participants in acceleration programs who enrolled in a Minnesota college within two years of high school graduation were awarded at least one dual credit by their college. The percentage varied across program types:

- Advanced Placement courses had the highest percentage (58 percent); other/unknown programs had the lowest (35 percent).
- Sixty-seven percent of those who participated in more than one program were awarded at least one dual credit (see figure 1).

A greater proportion of White students, students not eligible for the federal school lunch program, and students with higher academic achievement participated in acceleration programs relative to their peers

Compared with all 2011 Minnesota high school graduates, students who participated in acceleration programs were more likely to be female (57 percent versus 50 percent), White (87 percent versus 82 percent), and not eligible for the federal school lunch program (73 percent versus 62 percent; figure 2). Although most acceleration programs followed these overall trends, International Baccalaureate courses and other/unknown programs differed in the distribution of student and school-level characteristics:

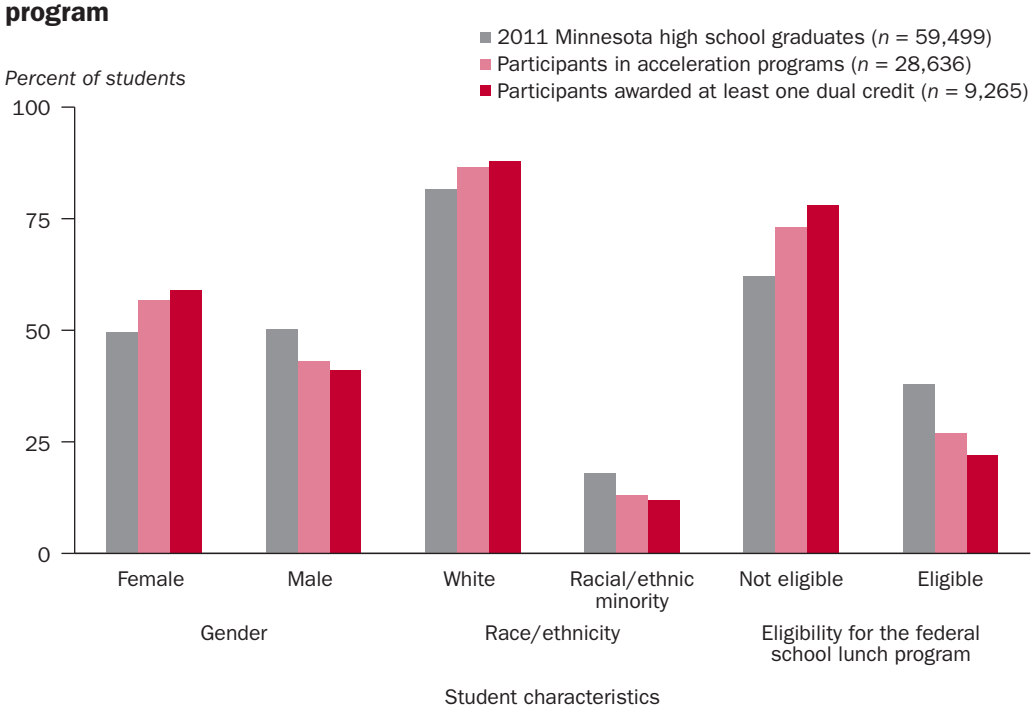
Figure 1. Rates of participation, enrollment in a Minnesota college, and award of dual credit varied by the type of acceleration program for the 2011 cohort of Minnesota public high school graduates



Note: Percentages of Minnesota high school graduates are based on 59,499 graduates; percentages of participants who enrolled in a Minnesota college are based on 33,298 graduates who enrolled in a Minnesota college within two years of high school graduation; and percentages of participants who were awarded at least one dual credit are based on the number of graduates who participated in each type of acceleration program who enrolled in a Minnesota college within two years of high school graduation, which varied by program type.

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

Figure 2. Compared with all 2011 Minnesota high school graduates, participants in acceleration programs were more likely to be female, White, and not eligible for the federal school lunch program



Note: Comparison is based only on students who graduated from high school and excludes dropouts, students who did not graduate with their cohort, and students in other grades.

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

- Compared with all 2011 Minnesota high school graduates, students who participated in International Baccalaureate courses were more likely to be Black (11 percent versus 7 percent) or Hispanic participants (6 percent versus 4 percent) and to have graduated from a nonrural high school (96 percent versus 66 percent).
- Compared with all 2011 Minnesota high school graduates, students who participated in other/unknown programs were more likely to be eligible for the federal school lunch program (41 percent versus 38 percent) and to have graduated from a smaller high school (64 percent versus 33 percent of) and less likely to have Minnesota Comprehensive Assessment scores in the upper third of the achievement distributions (22 percent for mathematics and 23 percent for reading versus 33 percent for both math and reading).

Compared with all participants in acceleration programs who enrolled in a Minnesota two- or four-year college, participants who were awarded at least one dual credit by the college in which they enrolled were disproportionately White (88 percent versus 85 percent) and not eligible for the federal school lunch program (78 percent versus 72 percent; see figure 2).

The majority of colleges in which participants in acceleration programs enrolled and were awarded dual credit were selective or very selective four-year colleges

The distribution of colleges in which participants in acceleration programs enrolled and that awarded at least one dual credit to participations leans toward more-selective four-year colleges:

- Forty-four percent of participants in acceleration programs enrolled in a selective college (versus 35 percent of all 2011 Minnesota high school graduates), 24 percent enrolled in a very selective

college (versus 15 percent), and 22 percent enrolled in a two-year nonselective college (versus 40 percent).

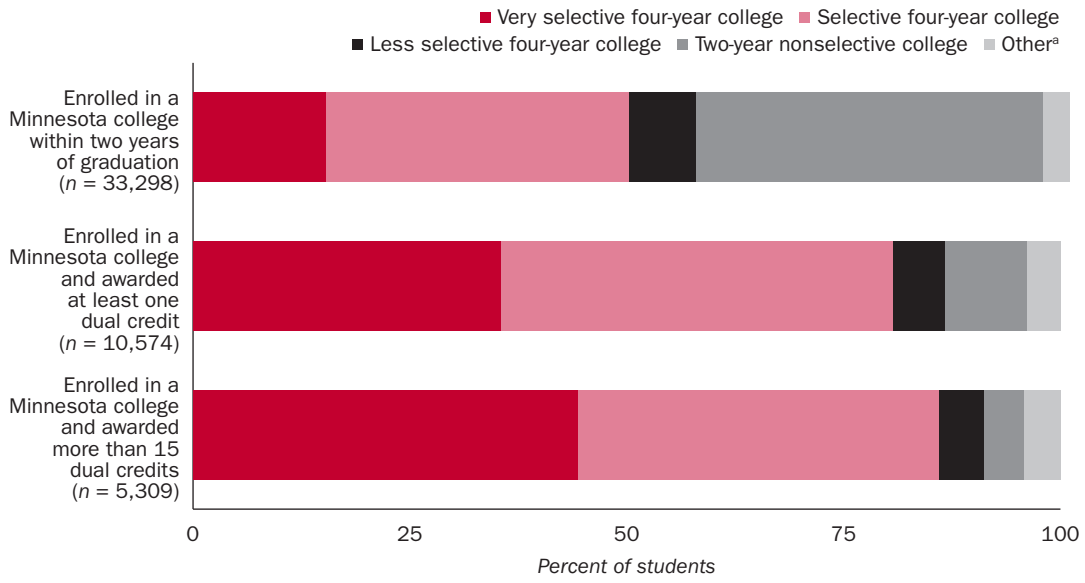
- Participants in acceleration programs who were awarded at least one dual credit disproportionately enrolled in a selective college (45 percent versus 35 percent of all 2011 Minnesota high school graduates) or a very selective college (35 percent versus 15 percent). Among students who were awarded more than 15 dual credits, enrollment in very selective colleges was even more pronounced (figure 3).

Minnesota high school graduates who participated in acceleration programs had higher rates of college enrollment, readiness, and persistence than did those who did not participate

Participation in acceleration programs was associated with more positive college outcomes in terms of enrollment in Minnesota colleges, taking only nonremedial courses in the first semester of college, and persisting to the second year of college. While the pattern does not suggest a causal relationship (these findings may be due in part to selection effects—that is, most acceleration programs attract higher performing students), the findings point to potential beneficial effects that could be explored through more rigorous research. Among all high school graduates, participants in acceleration programs were more likely than nonparticipants to:

- Be enrolled in a Minnesota college in fall 2011 (58 percent of participants versus 41 percent of nonparticipants).
- Be enrolled in a four-year Minnesota college in fall 2011 (46 percent versus 17 percent).
- Be enrolled in a Minnesota college within two years of high school graduation (64 percent versus 49 percent).

Figure 3. The percentage of students who enrolled in a selective or very selective Minnesota college was higher among participants in acceleration programs who were awarded dual credits than among all 2011 Minnesota high school graduates



Note: Includes only students who graduated from high school; excludes dropouts, students who did not graduate with their cohort, and students in other grades.

a. Includes four-year colleges that are not rated by Barron's and colleges with less than two-year certificate programs, such as cosmetology schools.

Source: Authors' calculations based on data obtained from the Minnesota Statewide Longitudinal Education Data System and Barron's Educational Series (2010).

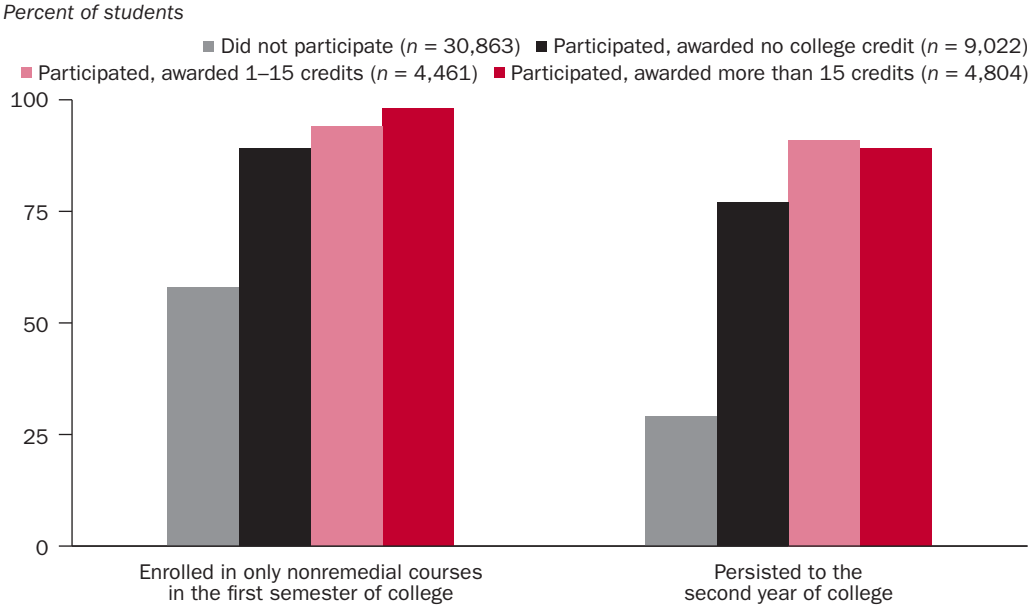
Among those who enrolled in a Minnesota college within two years of high school graduation, participants in acceleration programs were more likely to:

- Have taken only nonremedial courses in their first semester of college (89 percent of participants versus 58 percent of nonparticipants).
- Have persisted to the second year of college (83 percent versus 29 percent).

Among those who enrolled in a Minnesota college within two years of high school graduation, acceleration program participants had higher rates of college readiness and persistence than did nonparticipants, regardless of whether they were awarded any credits by their college of enrollment. The size of these differences is likely closely related to program eligibility requirements; it is possible that most acceleration programs attracted highly academically qualified students who would have performed well in college regardless of whether they participated in accelerated coursework.

- The percentage of students who enrolled in only nonremedial courses in the first semester of college was 89 percent among participants in acceleration programs who were awarded no college credit, 94 percent among participants who were awarded 1–15 credits, and 98 percent of participants who were awarded more than 15 credits, compared with 58 percent of nonparticipants (figure 4).
- The percentage of students who persisted to the second year of college was 77 percent among participants in acceleration programs who were awarded no credit by the college in which they enrolled, 91 percent among participants who were awarded 1–15 credits, and 89 percent among participants who were awarded more than 15 credits, compared with 29 percent of nonparticipants (see figure 4).

Figure 4. Among 2011 Minnesota high school graduates, participants in acceleration programs were more likely than nonparticipants to enroll in only nonremedial courses in the first semester of college and persist to the second year of college, regardless of whether or how many credits they were awarded



Note: Percentages are based on 2011 Minnesota high school graduates who enrolled in a Minnesota college within two years of high school graduation (n = 33,298). Percentages are unadjusted and do not account for other student- and school-level characteristics.

Source: Authors' calculations based on regression models using data from the Minnesota Statewide Longitudinal Education Data System.

The relationship between participation in acceleration programs and early college success remained after student and school-level characteristics were controlled for

After student- and school-level characteristics were controlled for,[2] participation in most acceleration programs was more strongly associated with the likelihood of enrolling and persisting in a Minnesota college. This is the case for each of four enrollment outcomes: enrolling in a Minnesota college in fall 2011, enrolling in a four-year Minnesota college in fall 2011, enrolling in a Minnesota college within two years of high school graduation, enrolling in only nonremedial courses, and persisting to the second year of college (figure 5).

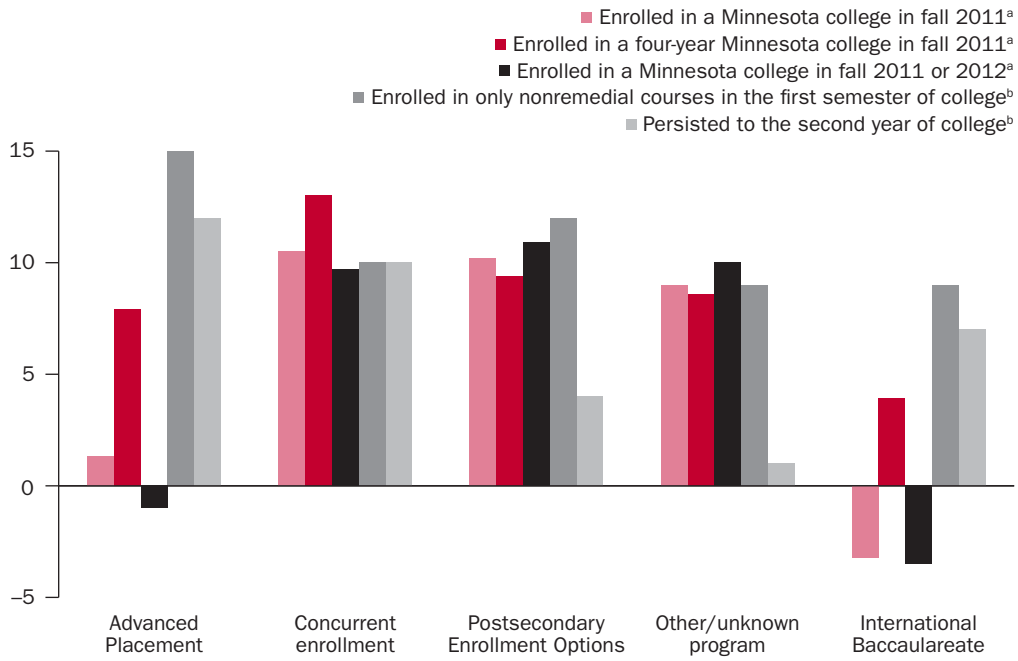
Implications of the study findings

The results of this study have several implications for educators and policymakers to consider regarding acceleration programs in Minnesota.

First, high schools and colleges could explore ways to expand acceleration program opportunities to several groups including racial/ethnic minority students, students eligible for the federal school lunch program, and students with lower academic achievement. Despite the fact that nearly half of graduates in the current study participated in acceleration programs, students in these three categories were less likely than their peers to have participated. Previous experimental research shows improved outcomes and a reduction in the attainment gap when dual-credit opportunities are expanded for these three groups (Berger, Turk-Bicakci, Garet, Knudson, & Hoshen, 2014).

Figure 5. Among the 2011 cohort of Minnesota high school graduates, participants in acceleration programs had more positive college outcomes than did nonparticipants

Adjusted difference between participants and nonparticipants (percentage points)



a. Based on all Minnesota high school graduates (n = 59,499).

b. Based on 2011 Minnesota high school graduates who enrolled in a Minnesota college within two years of high school graduation (*n* = 33,298).

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

Policymakers might explore whether eligibility requirements for acceleration programs could be relaxed without undermining program efficacy. Although Minnesota colleges set their own requirements for participation in acceleration programs, several two- and four-year colleges have common eligibility requirements that focus on students who achieve higher class ranks. More-selective colleges can have even stricter academic requirements. One exception to this finding was among acceleration programs classified as other/unknown programs, which include private college high school vouchers and one-to-one articulation agreements between specific colleges and high schools or districts. These programs appear to serve slightly different student populations, have different rates of awarding dual credits, and are associated with less positive postsecondary outcomes than other types of acceleration programs and with more positive postsecondary outcomes than nonparticipation. Given these findings, the Minnesota Department of Education and the Minnesota Office of Higher Education may benefit from a deeper examination of other/unknown programs, which may provide the opportunity for students who do not meet the eligibility requirements of other types of programs.

Second, participation in accelerated coursework may be as important as dual credits awarded in terms of college outcomes. Participants in acceleration programs were more likely than nonparticipants to enroll in a Minnesota college, and among students who enrolled in a Minnesota college within two years of high school graduation, participants in acceleration programs were more likely to take only nonremedial courses in their first semester and to persist to the second year of college, regardless of whether they were awarded any dual credits or how many they received. The relationships remained strong for most types of programs after student- and school-level characteristics such as race/ethnicity, eligibility for the federal school lunch program, and achievement (characteristics associated with higher college persistence rates; Kena et al., 2015; Stephan, Davis, Lindsay, & Miller, 2015) were controlled for. While the relationships are promising, more rigorous research will be required to understand their direct impacts on students, beyond the selection effects of programs attracting high-achieving students.

Finally, high schools may want to examine policies and procedures related to the awarding of dual credit for the institutions they partner with to ensure that students have the best chance of earned credits being accepted at most colleges. Only about half the high school graduates who enrolled in a Minnesota college were awarded any credit. Moreover, program participants eligible for the federal school lunch program (who may benefit the most from an overall reduction in their college costs) who enrolled in a Minnesota college were awarded dual credits at a lower rate than were other students. Legislation enacted in Minnesota in July 2015 (Minnesota Statute §124D.09 Subd. 12) guarantees credit to students who successfully complete Postsecondary Enrollment Options courses and enroll in a college in the Minnesota State Colleges and Universities system. The law provides a first step toward guaranteeing the transfer of earned credit from acceleration programs and can reduce students' total cost of attending college.

Limitations of the study

There are several limitations to this study. First, the data capture enrollments only in Minnesota colleges. Students who enrolled in an out-of-state college or a private college did not appear in the data for this study, and thus the results may not be generalizable to participants in acceleration programs in other states or Minnesota participants in acceleration programs who enrolled in an out-of-state college. However, the majority of Minnesota students enroll in an in-state public college (Aud et al., 2013).[3]

Second, the generalizability of the descriptive results that compared subgroups of students is limited to students who graduated from high school in 2011 on time. The sample excludes students who dropped out before graduation, students who did not earn enough credits to graduate with their cohort (that is, students who entered grade 9 in fall of 2007), and students from other cohorts who participated in acceleration

programs during the same time period. Because students eligible for the federal school lunch program and students with lower academic achievement are less likely to graduate from high school (Stark and Noel, 2015), the analysis likely underestimates the differences between participants in acceleration programs and the full population of high school enrollees.

Third, students who participated in Advanced Placement or International Baccalaureate courses may be underrepresented in the Minnesota Statewide Longitudinal Education Data System database. The records of participation in Advanced Placement and International Baccalaureate courses in the database are determined by whether a student sat for an examination in one of the programs. If a student completed the coursework in either program but did not sit for an examination, that student's participation would not appear in the database. Sitting for an examination is a common method for reporting participation in Advanced Placement courses among the College Board and several state education agencies,[4] and the number of students affected by the decision is likely very low.

Notes

1. The minimum standards in Minnesota are 60 semester credits for an associate's degree (Minnesota Office of Higher Education, n.d. b) and 120 semester credits for a bachelor's degree (Minnesota Office of Higher Education, n.d. c).
2. Regression models are descriptive only and do not imply a causal relationship between participation in acceleration programs and college outcomes because the models do not control for all differences between participants and nonparticipants. The models controlled for gender, race/ethnicity, eligibility for the federal school lunch program, and standardized math test scores at the student level and for high school urbanicity and size at the school level. The models did not control for variables not available through the Minnesota Statewide Longitudinal Education Data System, such as grade point average, parent education, and postsecondary aspirations.
3. In fall 2011 there were 248,903 undergraduates enrolled in a Minnesota public college and 91,725 undergraduates enrolled in a Minnesota private college (U.S. Department of Education, 2013).
4. For examples of this reporting method, see U.S. Department of Education (2012) and Minnesota Office of Higher Education (n.d. d).

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