

The Effects of Accelerated College Credit Programs on Educational Attainment in Rhode Island

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The effects of accelerated college credit programs on educational attainment in Rhode Island

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This study examined participation in accelerated college credit programs—dual enrollment, concurrent enrollment, and Advanced Placement courses—in Rhode Island high schools to understand their effects on educational attainment in the 2013/14 grade 9 cohort. The state, which has funded and promoted these opportunities for students to earn college credit during high school over the past five years, sought evidence of the programs' effects on participants' high school graduation rates, postsecondary enrollment rates, and enrollment rates in developmental education courses in college. The study found that male, economically disadvantaged, and racial/ethnic minority students were underrepresented in accelerated college credit programs. Participation in these programs had positive effects on students' rates of high school graduation and postsecondary enrollment. Among students in the cohort who enrolled in Rhode Island public colleges, participation was associated with lower rates of developmental education course enrollment in the first year of college. The effects of participating in an accelerated college credit program were similar for economically disadvantaged students and for their peers.

Why this study?

Like many states across the country, Rhode Island is concerned with improving youth college and career readiness so that its public school graduates are prepared for family-sustaining careers and Rhode Island employers have the workforce to thrive in a rapidly changing economy. Among jobs paying a living wage nationwide, 56 percent require a bachelor's degree, and the number of college-requisite jobs doubled from 1991 to 2016 (Carnevale, Strohl, Neil, & Gulish, 2018). Only 35 percent of Rhode Island adults between the ages of 25 and 64 have a bachelor's degree or higher, while an additional 28 percent have some college or an associate's degree (New England Secondary School Consortium [NESSC] Common Data Project, 2019). Additionally, because of long-standing inequities in access to high-quality educational opportunities, there are large disparities in high school and postsecondary outcomes by student demographic characteristics in the state (NESSC Common Data Project, 2019; Rhode Island Department of Education [RIDE], 2019). To address these concerns, Rhode Island has implemented strategies to improve high school graduation rates and postsecondary enrollment.

One strategy shown to improve high school graduation rates and support postsecondary enrollment is to allow high school students to earn college credits through accelerated college credit programs, such as dual and concurrent enrollment and Advanced Placement (AP) courses (An, 2013; Edmunds et al., 2017; Giani, Alexander, & Reyes, 2014; Haxton, Song, Zeiser, Berger, & Turk-Bicakci, 2016; Struhl & Vargas, 2012). In 2014/15, Rhode Island implemented such a strategy through the PrepareRI Dual Enrollment Fund, which enables high school students to take dual and concurrent enrollment coursework at the state's three public higher education institutions (see a description of Rhode Island dual and concurrent programs in box 1).¹ Through Rhode Island's dual enrollment option, individual high school students can enroll directly in college courses, which they attend either on the college campus or online. Concurrent enrollment courses are taught at the high school by high school teachers who have gone through a

For additional information, including background on the study, technical methods, and supporting analyses, access the report appendices at <https://ies.ed.gov/ncee/edlabs/projects/project.asp?projectID=5680>

¹ Each Rhode Island public college has established minimum eligibility criteria for high school students who wish to take dual and concurrent enrollment courses affiliated with the institution.

certification procedure with the college so that the course can be recognized for college credits.² Enrollment in the state’s dual and concurrent enrollment programs has increased 150 percent since 2015 (PrepareRI, 2018). Among students in the grade 9 cohort of 2014/15, more than a quarter had earned college credit from one of Rhode Island’s public colleges by the time they finished high school (PrepareRI, 2018). The state has also encouraged districts to expand the availability of AP courses, which has resulted in record numbers of students’ taking an AP exam in recent years (RIDE, 2020). By earning a passing test score on a nationally administered AP exam, students can earn college credits recognized by most postsecondary institutions, including those in Rhode Island. AP courses are designed to provide high school students with introductory level college course material so that they can earn college credit and bypass introductory courses in college (College Board, 2020).

Box 1. Accelerated college credit programs in Rhode Island

In 2013, the Rhode Island General Assembly passed legislation (RIGL 16-100) that called for the adoption of a statewide policy for dual and concurrent enrollment that allows students to take college courses to earn credit at both secondary schools and higher education institutions. The Board of Education subsequently adopted regulations in April 2015 that provide all eligible Rhode Island high school students with access to college-level coursework while they are still in high school. In 2015 the state also created Governor Raimondo’s PrepareRI Dual Enrollment Fund, which provides funding for qualifying students to take college courses from any of Rhode Island’s public higher education institutions as part of their high school requirements at no cost to the student. Under the state regulations, high school students can earn college credits in two ways: dual enrollment primarily occurs at Rhode Island’s two-year public college, whereas concurrent enrollment is offered primarily through the state’s two public four-year colleges (see box 2 for definitions). Students also have the option of taking Advanced Placement (AP) courses, and all three public Rhode Island colleges have policies for accepting AP test scores for some form of college credit, as do many private colleges nationwide. Accelerated college credit programs are one of the state’s strategies for preparing all students to be ready to enroll in credit-bearing college courses by the time they graduate from high school as part of the PrepareRI College Readiness project (PrepareRI, 2018).

In the context of fast growth and high interest in dual and concurrent enrollment and AP testing, and of large and persistent gaps in postsecondary outcomes between different student groups, stakeholders in Rhode Island would like to understand the effect of student participation in such programs on high school graduation and postsecondary outcomes. Specifically, the Rhode Island Department of Education (RIDE), the Rhode Island Office of the Postsecondary Commissioner (RIOPC), and state legislators would like to know the extent to which dual enrollment, concurrent enrollment, and AP test-taking increase high school completion rates and positively affect postsecondary enrollment rates and outcomes. Given that inequitable access to educational opportunities contributes to lower average educational attainment among economically disadvantaged students (Oakes, 2008; Stark & Noel, 2015), the state is especially interested in learning whether participation benefits low-income students. The state education agency would also like to establish the extent to which different groups of students are accessing accelerated college credit programs to help target efforts to expand these opportunities.

The state would also like to know whether there are meaningful differences in the student outcomes associated with the three different types of accelerated college credit programs so that it can align resources with the degree of anticipated benefit to students. Because the state funds both dual and concurrent enrollment programs and the two approaches require different investments, stakeholders desire information that compares outcomes for students who participated in these two programs in particular. In addition to addressing the state’s information needs, this study contributes to the evidence base regarding the effects of accelerated college credit programs; it also adds exploratory evidence to the limited research available on concurrent enrollment outcomes as distinct from dual enrollment (see appendix A).

² Definitions of dual and concurrent enrollment vary across states and in the research literature, with some sources defining “dual enrollment” as including courses taught at high schools. The definitions stated here are those used in Rhode Island state policy.

Research questions

The study examined student participation and outcomes in Rhode Island’s accelerated college credit programs. The student outcomes analyzed were high school completion, college enrollment, and college readiness.

The study addressed three questions:

1. What are the participation rates in Rhode Island’s accelerated college credit programs overall and by each type of program?
 - How do student and school characteristics compare across each program type and between participants and nonparticipants?
2. What is the effect of participation in any one of Rhode Island’s three accelerated college credit programs on each of the student outcomes listed above?
 - Do these effects differ between economically disadvantaged students and their non-economically disadvantaged peers?
3. How do these outcomes differ across students who participated in each type of program—by enrolling in dual or concurrent enrollment courses, or by taking AP tests—after controlling for student characteristics?

The study examined these questions for a sample of 8,726 students who were first-time ninth graders in Rhode Island public schools in the 2013/14 school year. The analyses addressing questions two and three were performed on a matched sample of accelerated college credit program participants and nonparticipants drawn from this cohort. The analyses for the second research question matched participating and nonparticipating students who were statistically similar before they started high school. This design reduced the contribution of factors such as previous academic achievement to the estimated differences in outcomes, although it could not entirely eliminate the effects of such factors. Because the three groups of students participating in each specific type of program were not statistically similar before high school, findings for the third research question should be interpreted as exploratory and not as impact estimates (see a summary of the data sources, sample, and methods in box 3 and additional detail in appendix B).³

Box 2. Key terms

Accelerated college credit program. A program that enables high school students to earn college credit. Three such programs were included in this study: dual and concurrent enrollment courses and AP courses.

Advanced Placement (AP) course. A high school course that culminates in a standardized subject area assessment administered by the College Board. Many colleges, including all three Rhode Island public colleges, give students course credits based on their AP test scores. In this study, because AP course enrollment data are not available, AP test-taking is used as a proxy for AP course enrollment.

College enrollment. Enrollment in a postsecondary institution. In this study, college enrollment is defined as having an enrollment record at any type of postsecondary institution—including public, private, two- and four-year, and out of state institutions—within 12 months after high school graduation.

College readiness. The ability of a student to enroll and succeed in college credit courses without the need for developmental or remedial education (non-credit-bearing courses that prepare students for college English and mathematics; Conley, 2007). In this study, a student who does not enroll in one or more developmental education courses during their first year of college demonstrates (or “meets the definition of”) college readiness. Because data were not available at the time of the analysis for students enrolling in development education after their first year, some students may be misclassified as college ready.

³ Data on dual and concurrent enrollment were available only for grades 11–12, the grade levels at which approximately 98 percent of students take such courses.

Concurrent enrollment program. A program that allows high school students to take approved college courses taught by instructors on staff at the students' high school. Students earn credits that are accepted by the high school as well as by the college. In Rhode Island students do not pay tuition or other costs for a concurrent enrollment course. The instructor, although employed by the high school, must be approved by the higher education institution as an adjunct faculty member.

Dual enrollment program. A program that allows high school students to attend college courses taught by college faculty from a public or private college. Students take the courses on the college campus or online if the college offers the course in that format. Students earn credits accepted by the high school as well as by the college. In Rhode Island the state pays for the cost of dual enrollment courses at the state's public colleges. Students are responsible for the costs of dual enrollment courses at private postsecondary institutions. Each institution has its own eligibility criteria, such as a minimum grade point average.

Economically disadvantaged. A designation that refers to a student's eligibility for the National School Lunch Program (an indicator of economic disadvantage). Although program eligibility is an imperfect proxy for economic disadvantage because it does not capture other dimensions of socioeconomic status, it is the only indicator reliably available for all students through the state data collection system.

Predicted probability. The likelihood of an outcome estimated using a set of predictor variables in a statistical analysis. For example, the study team used a statistical model based on students' grade 8 characteristics and academic achievement, their accelerated college credit program participation, and the first high school they attended to predict how likely students were to attain an outcome. The results are presented as predicted probabilities for different groups—that is, given what is known about a group of students, the value represents how likely they are to attain the outcome. (See a more detailed explanation in appendix B.)

Limitations

This study is not based on an experimental design; therefore, unobserved differences between students who chose to participate in accelerated college credit programs and those who did not may account for the differences in outcomes reported here. A study of dual enrollment outcomes in Texas found much more modest effects after applying a design that accounted for unmeasured factors, such as student motivation and parental education (Miller et al., 2018). Experimental studies of accelerated college credit in the context of early college high schools have also found positive but smaller effects compared with those estimated in this study—a 5 to 9 percentage point increase in high school graduation rates and a 12 to 16 percentage point increase in college enrollment rates (Edmunds et al., 2017; Haxton et al., 2016). Rhode Island policymakers may want to consider the more modest effects found in experimental studies when making decisions about resource allocations. However, the sizes of the effects in the present study were large enough that any unobserved factor would have to be substantial to fully account for the large estimated differences between participants and nonparticipants. To take an example of a potential contributing factor not available for this study, an analysis of nationally representative data found that students who have a parent with a baccalaureate degree enroll in college at a rate 21 percentage points higher than that of first-generation students (Cataldi, Bennett, Chen, & Simone, 2018). The present study found a 30 percentage point effect on college enrollment even after controlling for characteristics closely related to parental education, such as economic disadvantage and race/ethnicity.

In particular, the findings estimating the relationship of each individual accelerated college credit program to outcomes should be interpreted with caution because the study methods do not provide a strong enough basis to draw causal conclusions. Although the study provides some exploratory indications of each of the three programs' efficacy relative to the others, further rigorous study is needed to confirm these suggestive findings.

Additionally, this study sample was limited to participating and nonparticipating students who were similar; therefore, it included only students in the cohort who could be matched. The result was a study sample that differed in notable ways from the cohort at large. Among accelerated college credit participants, 55 percent were included in the matched sample. These students included in the model analyzing program effects had lower previous academic achievement levels on average and were more likely to be racial/ethnic minorities, male,

economically disadvantaged, or multilingual learners than the full sample of all program participants (see participant group means before and after matching, reported in table B2 in appendix B). Conversely, among nonparticipants, the 38 percent retained in the sample had much higher previous academic achievement levels, and were less likely to be male, be economically disadvantaged, have an individualized education program, or be chronically absent on average than were the full sample of nonparticipants (see comparison group means before and after matching in table B2 in appendix B). In short, the program participants and the nonparticipants in the cohort at large differed in terms of the several background characteristics that are typically associated with academic attainment. Thus, the matched sample is not entirely representative of the population of participants or of nonparticipants.

As a consequence, although the matching procedure allowed the researchers to maintain a greater level of confidence in attributing differences in outcomes to accelerated college credit program participation, it also somewhat limited the generalizability of the findings to all types of students. For example, the conclusions drawn are stronger for students who are below or near the average in academic achievement and indicators of economic disadvantage, but may not be as relevant to higher-achieving, nondisadvantaged students (see Box 3 for additional limitations).

Box 3. Data sources, sample, and methods

Data sources. The study used data from Rhode Island DataHUB, the state’s longitudinal data system, which houses linked individual student data spanning K–12 through postsecondary education. Data used in the study included information on high school course enrollment and student characteristics from the Rhode Island Department of Education, postsecondary enrollment data from the National Student Clearinghouse, and postsecondary developmental education course enrollment data from the state’s two- and four-year public colleges.

Sample. The sample consisted of 8,726 students who were first-time ninth graders in Rhode Island public schools in the 2013/14 school year. Students enrolled in charter schools, alternative schools, and vocational–technical schools were included, as were students who repeated grades after 2013/14, dropped out of high school, changed schools, or left the Rhode Island public education system. All students who met the cohort definition were included, with the following exceptions: If they were not also enrolled in grade 8 during the previous year in the state’s public schools, meaning that no measure of the previous year’s academic achievement was available (8 percent); if they were enrolled in grade 8 but did not have a valid standardized assessment score that year (4 percent); if their 2013/14 enrollment was less than 30 days long (1 percent); or if their records were not associated with a specific high school (1 percent). These criteria excluded 12 percent of the original pool of 9,915 students, with some students having been excluded for multiple reasons. High school and postsecondary enrollment data through fall 2019 were available. (See additional analyses performed for the 2014/15 grade 9 cohort, with results similar to those reported in the body of this report, in appendix D.)

Methodology.

Analyzing participation rates: The study team used course enrollment records to identify students who enrolled in dual enrollment or concurrent enrollment courses. Because course enrollment data were not available for Advanced Placement (AP) courses, students were identified as participating in AP if they took an AP test. If a student participated in any of these three accelerated college credit programs at least once in fall 2013 through fall 2019, they were coded as a program participant. Participation rates were then disaggregated by student and school characteristics.

Analyzing the effect of participating in any accelerated college credit program on high school completion and college enrollment: The study team matched participating students with nonparticipating students in the sample to create a comparison group whose members had similar characteristics before starting high school. Some but not all participating students were matched with a nonparticipating student in the same high school. Using the program participants as the reference group, the study team looked for matches among a pool of program nonparticipants. Because the matching process used participants as the reference group, the results come closer to representing the program effect on the participants—in other words, the difference between outcomes that would have happened to program participants had they not been given the opportunity to participate and the outcomes that occurred.

Using this matched group of participants and comparison students, the study team performed a series of statistical tests to estimate the effect of participating in any accelerated college credit program on each of the outcomes. To see whether the relationship was different among economically disadvantaged students, the study team also examined the effect of the programs on students who were and were not eligible for the National School Lunch Program.

Analyzing the relationship of any accelerated college credit program to college readiness: A student who was not enrolled in a developmental education course in their first year of college was defined as demonstrating college readiness in this study. Because developmental education course enrollment data were available only for students who enrolled in Rhode Island public colleges, the conclusions that can be drawn from the analyses are more limited than for the other outcomes. The study team used statistical models to estimate the relationship between program participation and four possible postsecondary outcomes: enrolling in a Rhode Island public college and taking developmental education courses, enrolling in a Rhode Island public college and not taking developmental education courses, enrolling in another type of college, and not enrolling in college. This model allowed for a direct comparison between the odds of enrolling in a Rhode Island public college and taking developmental education courses and enrolling in a Rhode Island public college and not taking developmental education courses.

Analyzing the relationship of each type of accelerated college credit program to high school completion, college enrollment, and college readiness: The study team created indicators for whether a student ever enrolled in a dual enrollment course during the years analyzed in the study, ever enrolled in a concurrent enrollment course, and ever took an AP test. This set of indicators was then used to predict each outcome. The statistical models produced estimates of the relationship between each outcome and the specific type of accelerated college credit program compared with not participating in any such program—for example, dual enrollment compared with not enrolling in any accelerated college credit program. Fifteen percent of students participated in more than one of the three types of programs.

Data limitations. Dual and concurrent enrollment data were available for grades 11 and 12 but not for grades 9 and 10 for the 2013/14 grade 9 cohort because the state began reliable collection of these data in 2015/16. Based on complete grade 9–12 data available from a later cohort (2015/16 ninth graders), an estimated 2 percent of students could have been incorrectly classified as not participating in these programs because of these missing years of enrollment data. Because dual enrollment was offered almost exclusively by Rhode Island’s two-year public college whereas concurrent enrollment was offered mainly through the state’s four-year public colleges, it was difficult to disentangle the effects of the program type from the effects of the college.

AP participation was represented by AP test-taking rather than by AP enrollment because of data limitations, meaning that some students who enrolled in AP courses but did not take the test may have been misclassified as nonparticipants. If the students who take the tests differ from those who only enroll in the courses, this distinction could bias the estimate of the relationship between AP participation and student outcomes. For example, if students who perform poorly in the class choose not to take the test, the estimate of the positive effect of AP courses could be inflated. The testing fee may also have excluded some students who enrolled in AP courses, meaning that lower-income students AP might not be fully represented in the sample.

Developmental education enrollment status was available only for the students’ first year of college after they graduated from high school. Students who placed into such courses but did not enroll in them until later would be misclassified as college ready. Finally, the study represented student race/ethnicity with a simple two-category indicator because of analytic difficulties related to small sample sizes. Further research could explore the differences in the experiences of Black, Hispanic, and Asian students with accelerated college credit programs.

See Limitations section of the report above for additional information.

Findings

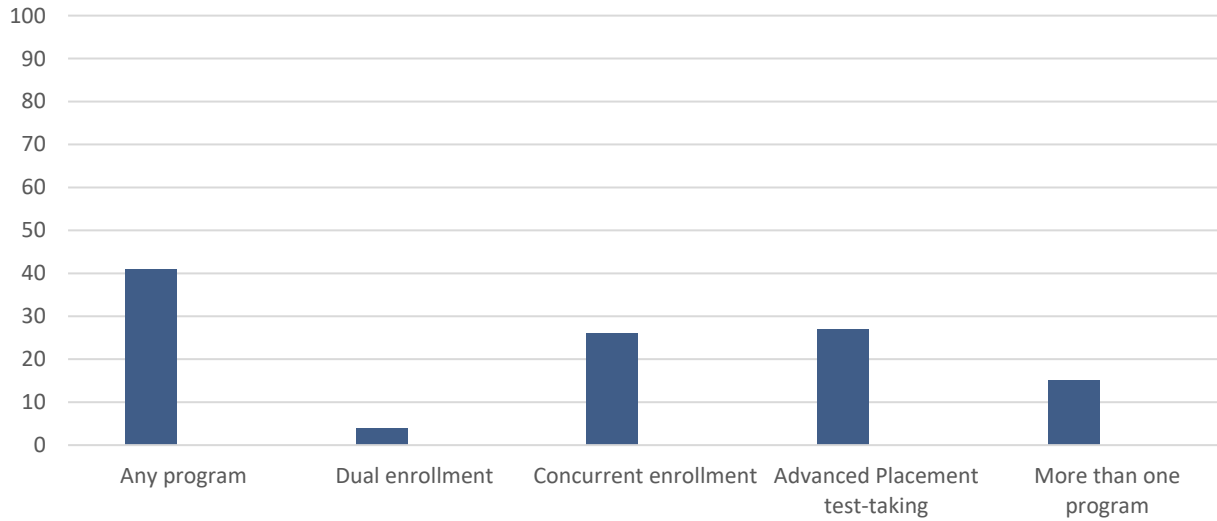
This section presents the key findings, including those pertaining to patterns of student participation in accelerated college credit programs and the academic outcomes of participants. A presentation of descriptive findings on participation by student characteristics is followed by the results of an analysis using a matched sample to study the effects of participation in any of the three programs on student outcomes. Then the relationships between outcomes and participating in each individual type of program are presented.

Nearly half of all students participated in at least one accelerated college credit program, with more participating in Advanced Placement and concurrent enrollment programs than in dual enrollment.

Among students in the 2013/14 grade 9 cohort, 41 percent had participated in one or more of the three accelerated college credit programs by grade 12. The largest proportion of students (27 percent) took AP tests, while a similar percentage (26 percent) took concurrent enrollment courses. Dual enrollment was much less common at 4 percent of students (figure 1; see table C1 in appendix C for detailed participation figures). Approximately 15 percent of students in the cohort participated in more than one accelerated college credit program.

Figure 1. Forty-one percent of students participated in one or more accelerated college credit programs; 2013/14 grade 9 cohort

Percentage of students participating



Note: The sample size is 8,726 students who were first-time ninth graders in Rhode Island public schools in 2013/14. See table C1 in appendix C for more information. Percentages sum to more than 100 because students could participate in more than one program. The percentages for dual enrollment, concurrent enrollment, and Advanced Placement test-taking displayed in the figure represent the percentage of students who participated in the given program, regardless of whether they also participated in any other programs. The majority of students participating in more than one program enrolled in concurrent enrollment and took one or more Advanced Placement tests.

Source: Authors' analysis of data from Rhode Island Department of Education.

Racial/ethnic minority, male, and economically disadvantaged students were underrepresented in accelerated college credit programs.

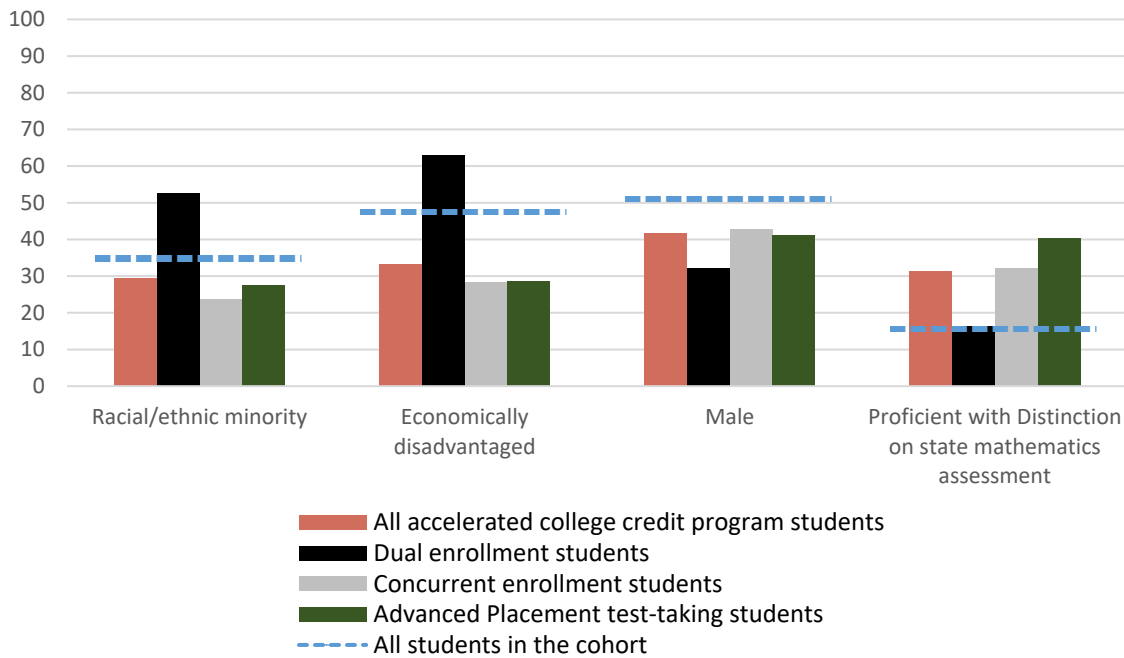
Compared with the 2013/14 grade 9 cohort overall, a lower proportion of students who participated in accelerated college credit programs were racial/ethnic minority, male, economically disadvantaged, or higher achieving in mathematics in grade 8 (figure 2). Specifically, compared with the cohort overall, a lower percentage of students participating in an accelerated college credit program belonged to a racial/ethnic minority (30 percent of participants versus 35 percent in the cohort) or were economically disadvantaged (33 percent of participants versus 48 percent in the cohort). Male students were also less represented in the programs than in the cohort (42 percent of participants versus 51 percent in the cohort; see figure 2). Participants were also less likely to experience chronic absenteeism (8 percent of participants versus 17 percent of the cohort) or suspensions (3 percent of participants versus 10 percent of the cohort). Previous academic achievement was higher on average among accelerated college credit program participants, with 31 percent of participants versus 16 percent in the cohort at large scoring at the “proficient with distinction” level on the state standardized mathematics assessment in grade 8. (For more detailed student characteristics, see tables C2 through C5 in appendix C.)

Examining each program separately showed that although students taking AP tests had characteristics similar to those of students in concurrent enrollment, dual enrollment served students with a different profile.

- Students taking AP tests had a profile similar to that of concurrent enrollment students (see figure 2 and table C2 in appendix C).
- Although dual enrollment courses reached a small proportion of students, this group included a higher proportion of students who were racial/ethnic minority (53 percent) or economically disadvantaged (56 percent) than among concurrent enrollment students (24 percent racial/ethnic minority and 23 percent economically disadvantaged). AP test-takers were similar to concurrent enrollment students (27 percent racial/ethnic minority and 29 percent economically disadvantaged).
- Dual enrollment students also had chronic absenteeism and suspension rates similar to those of the cohort at large (17 percent and 9 percent respectively), whereas concurrent enrollment students had lower rates (7 percent and 3 percent), as did AP test-takers (5 percent and 2 percent).
- Although both dual and concurrent enrollment courses are intended to present students with college-level content, dual enrollment students had previous academic achievement levels similar to those of the cohort at large (16 percent proficient with distinction on the state standardized mathematics assessment in grade 8), whereas concurrent enrollment students had higher achievement levels (32 percent proficient with distinction). AP test-takers also had higher rates of achieving proficient with distinction (40 percent) than the statewide average of 16 percent.

Figure 2. Lower proportions of students participating in accelerated college credit programs were racial/ethnic minorities, male, economically disadvantaged, or high academic achievers in grade 8 than among the cohort as a whole; 2013/14 grade 9 cohort

Percentage of students who have each characteristic, by accelerated college credit program



AP is Advanced Placement.

Note: The sample size is 8,726 students who were first-time ninth graders in Rhode Island public schools in 2013/14. See table C2 in appendix C for more information.

Source: Authors' analysis of data from Rhode Island Department of Education.

Dual enrollment participation was concentrated in a few urban schools, whereas concurrent enrollment participation was more prevalent among suburban schools.

More than half (55 percent) of dual enrollment students attended urban schools, compared with 22 percent of students in the cohort overall. Moreover, although dual enrollment theoretically was available to students in all high schools, participating students were concentrated in a handful of urban high schools located near Rhode Island public colleges, with 32 percent of dual enrollment students in the 2013/14 grade 9 cohort attending two Providence high schools. The majority (75 percent) of concurrent enrollment students attended suburban schools, compared with 67 percent of students in the cohort at large (see table C3 in appendix C). Concurrent enrollment was available in the majority of high schools, but 13 percent of schools did not offer such courses, and another 19 percent of schools enrolled fewer than 10 students in concurrent enrollment courses. Among dual enrollment students, 29 percent attended a school within one mile of a Rhode Island public college campus, compared with 2 percent of concurrent enrollment students. Advanced Placement test-takers attended urban, suburban, and rural schools at rates similar to those of the cohort as a whole. Dual enrollment students also attended schools with lower accountability ratings on average (21 percent in the two highest categories) than did concurrent enrollment students (47 percent) and AP test-taking students (50 percent).

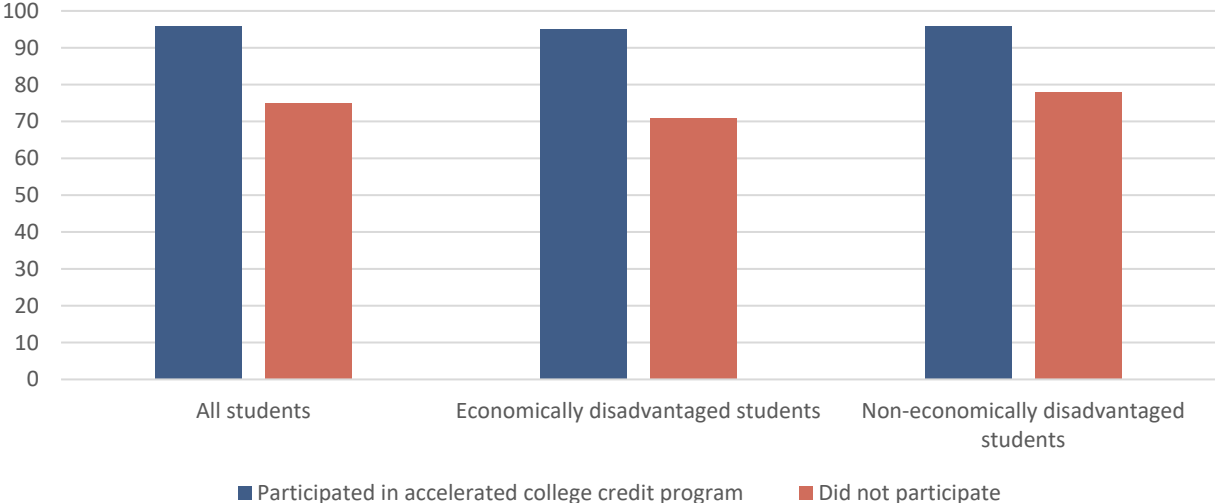
Participation in an accelerated college credit program has a large, positive, statistically significant effect on the probability of graduating from high school, enrolling in college within a year of graduating, and avoiding enrollment in developmental education courses during the first year at a Rhode Island public college.

Students who participate in accelerated college credit programs are more likely to graduate high from school, according to a comparison with a matched sample of nonparticipating students who were similar to participants

based on their grade 8 characteristics (including scores on the state’s standardized mathematics assessment, number of absences and suspensions, and demographic characteristics; see table B3 in appendix B). A student’s probability of graduating from high school increases by 21 percentage points if the student participated in an accelerated college credit program (figure 3; see tables C6 through C8 in appendix C).

Figure 3. Accelerated college credit programs have a positive effect on high school graduation.

Predicted probability of student’s graduating from high school (percent) based on model, 2013/14 grade 9 cohort



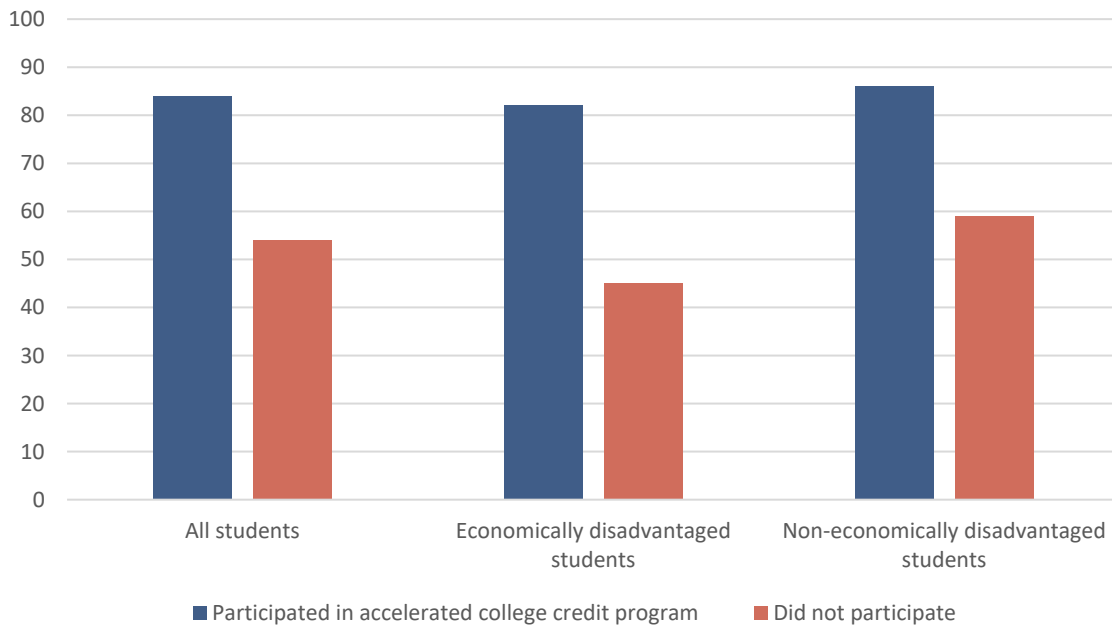
Note: The sample size is 3,916 students in a matched sample drawn from students who were first-time ninth graders in Rhode Island public schools in 2013/14. Predicted probabilities were estimated using a statistical model. The difference in probability between participants and nonparticipants is statistically significant for all students, among economically disadvantaged students, and among non-economically disadvantaged students. See appendix B and tables C7 and C8 in appendix C for more information.

Source: Authors’ analysis of data from Rhode Island Department of Education.

Similarly, accelerated college credit program participation increases the probability of enrolling in college within a year of high school graduation by an estimated 30 percentage points (figure 4; see tables C6 through C8 in appendix C).

Figure 4. Accelerated college credit program participation has a positive effect on enrollment in college within a year of graduating.

Predicted probability of student's enrolling in college (percent) based on model, 2013/14 grade 9 cohort



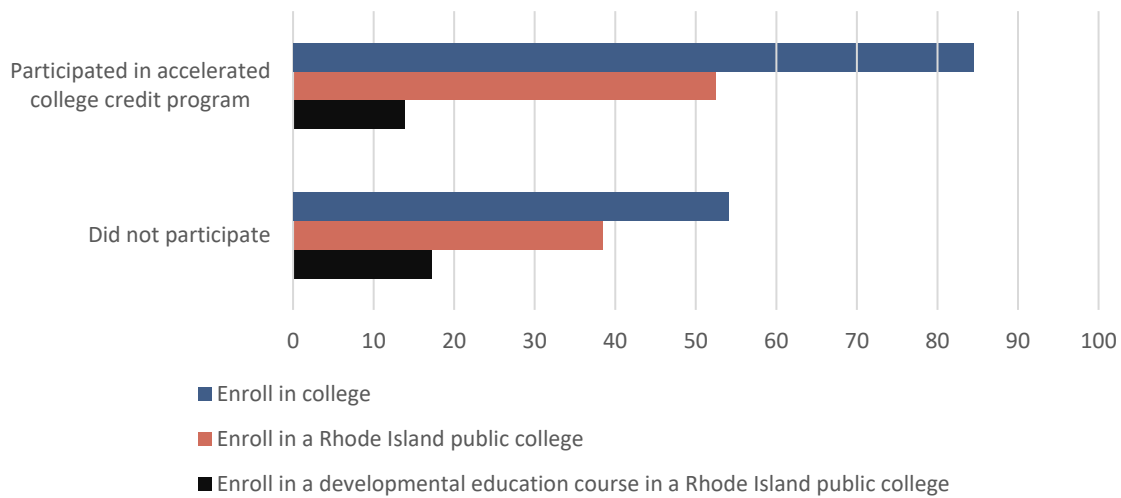
Note: The sample size is 3,916 students in a matched sample drawn from students who were first-time ninth graders in Rhode Island public schools in 2013/14. Predicted probabilities were estimated using a statistical model. The difference in probability between participants and nonparticipants is statistically significant for all students, among economically disadvantaged students, and among non-economically disadvantaged students. See appendix B and tables C7 and C8 in appendix C for more information.

Source: Authors' analysis of data from Rhode Island Department of Education.

Accelerated college credit program participants are predicted to enroll in developmental education courses during their first year of college at a lower rate than nonparticipants. Developmental education course enrollment was available only for students who enrolled in a public college in the state, so the study can draw conclusions only about students in those settings. Fifty-two percent of accelerated college credit program participants are predicted to enroll in a Rhode Island public college, and 26 percent of those students are predicted to enroll in developmental education courses. In contrast, 38 percent of nonparticipants are predicted to enroll in a Rhode Island public college, and 45 percent of those students are predicted to enroll in developmental education courses. Each of the three accelerated college credit programs demonstrates this positive relationship with avoiding developmental education courses in Rhode Island state colleges (figure 5; see tables C9 through C11 in appendix C).

Figure 5. Accelerated college credit program participation is associated with lower rates of enrollment in developmental education courses in the first year at a Rhode Island public college.

Predicted probability of student's attaining each outcome (percent) based on model, 2013/14 grade 9 cohort



Note: The sample size is 3,916 students in a matched sample drawn from students who were first-time ninth graders in Rhode Island public schools in 2013/14. Developmental education course enrollment was available only for students who enrolled in a Rhode Island public college, and only for the student's first year enrolled after graduating from high school. Predicted probabilities were obtained using a statistical model to estimate the probability of four postsecondary outcomes on the full sample of 3,916 students: (a) enrolling in a Rhode Island public college and taking developmental education courses, (b) enrolling in a Rhode Island public college and not taking developmental education courses, (c) enrolling in another type of college, and (d) not enrolling in college. The predicted probabilities for enrolling in a Rhode Island public college shown in the figure are the sum of the predicted probabilities for (a) and (b); the predicted probabilities for enrolling in college are the sum of the predicted probabilities for (a), (b), and (c). The difference in probability between participants and nonparticipants is statistically significant for each outcome. See appendix B and tables C10 and C11 in appendix C for more information. Source: Authors' analysis of data from Rhode Island Department of Education.

The effects of accelerated college credit program participation were similar for economically disadvantaged students and non-economically disadvantaged students.

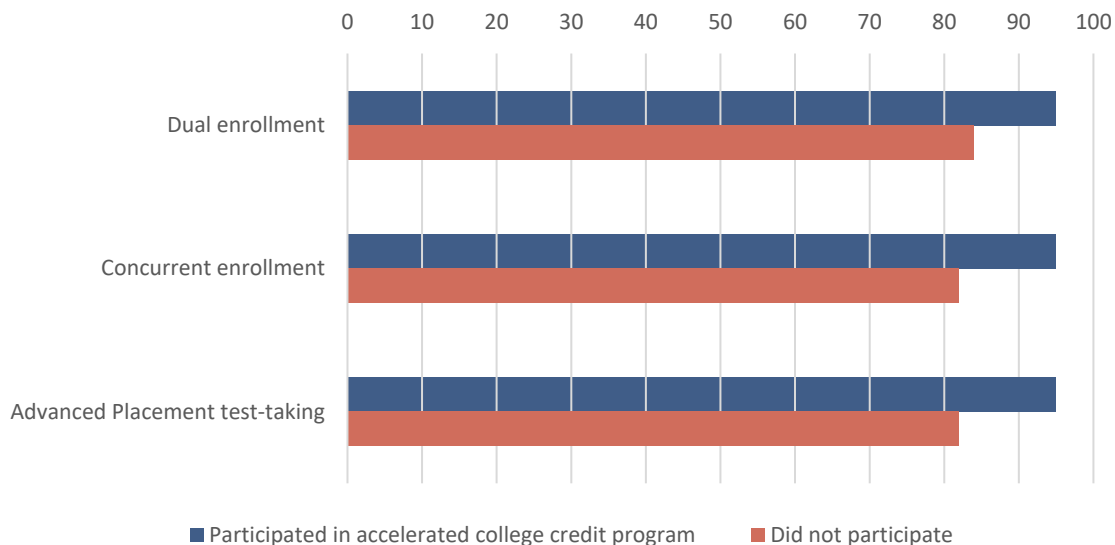
Economically disadvantaged students are predicted to experience increases in their rates of high school graduation and college enrollment, and decreases in their rates of developmental education enrollment in Rhode Island public colleges, similar to the differences predicted for other students (see figures 3 and 4 and tables C12 and C13 in appendix C).

Although each of the three accelerated college credit programs is associated with increased predicted rates of high school graduation and college enrollment, and with lower rates of developmental education course enrollment at Rhode Island public colleges, Advanced Placement test-taking is associated with a significantly larger increase than is dual enrollment in the predicted rate of college enrollment.

When considered separately in an exploratory analysis, each of the three accelerated college credit programs was associated with benefits for participating students in terms of educational attainment outcomes. The study showed no significant differences among the three programs in their relationships to high school graduation (figure 6; see tables C14 and C15 in appendix C).

Figure 6. Dual enrollment, concurrent enrollment, and Advanced Placement programs are each associated with increased predicted high school graduation rates compared with nonparticipation; the size of this association was similar across the three programs; 2013/14 grade 9 cohort

Predicted probability of student's graduating from high school (percent) based on model



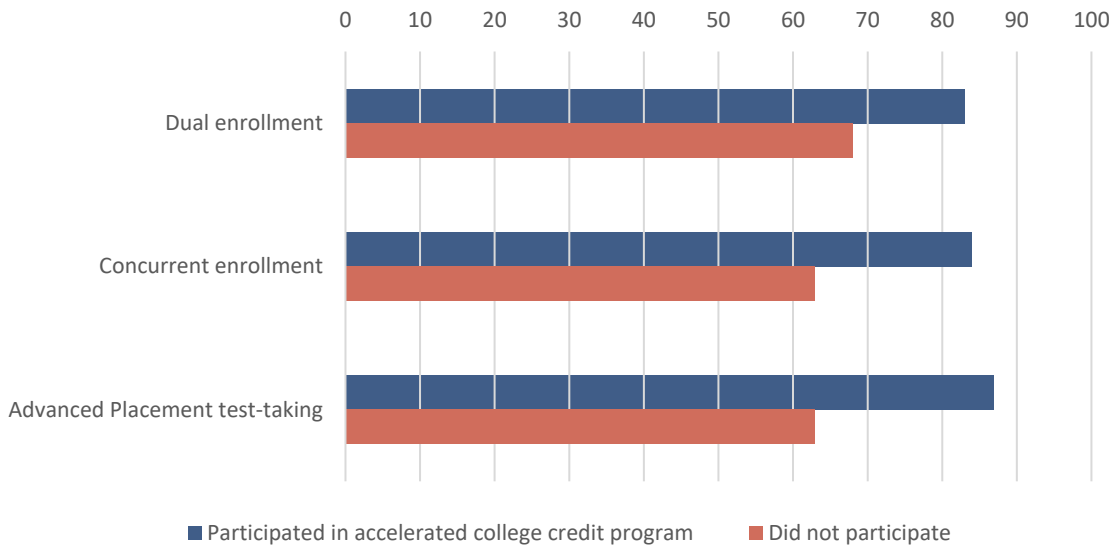
Note: The sample size is 3,916 students in a matched sample drawn from students who were first-time ninth graders in Rhode Island public schools in 2013/14. Predicted probabilities were estimated using a statistical model. The difference in probability between participants and nonparticipants is statistically significant for each of the three types of program participation. No statistically significant differences were found in the size of the regression coefficients for each of the three programs. Participants in any accelerated college credit program were matched with nonparticipants; however, there were not separate matched groups representing each type of program. Fifteen percent of students participated in more than one type of program. See appendix B and tables C14 and C15 in appendix C for more information.

Source: Authors' analysis of data from Rhode Island Department of Education.

In contrast, AP test-taking was associated with a larger predicted increase in the rate of college enrollment than was dual enrollment (a 24 percentage point increase compared with a 15 percentage point increase shown in figure 7; see tables C14 and C15 in appendix C). Concurrent enrollment did not differ significantly from the other two programs in its relationship to college enrollment. No evidence was found of differences across the three programs in the relationship with the rate of enrolling in developmental education in a Rhode Island public college.

Figure 7. Dual enrollment, concurrent enrollment, and Advanced Placement test-taking are each associated with increased predicted college enrollment rates compared with nonparticipation; the size of the association was larger for Advanced Placement test-taking than for dual enrollment; 2013/14 grade 9 cohort

Predicted probability of student’s enrolling in college (percent) based on model



Note: The sample size is 3,916 students in a matched sample drawn from students who were first-time ninth graders in Rhode Island public schools in 2013/14. Predicted probabilities were estimated using a statistical model. The difference in probability between participants and nonparticipants is statistically significant for each of the three types of program participation. A statistically significant difference was found between the sizes of the regression coefficients for Advanced Placement test-taking and dual enrollment, but no such difference was found between concurrent enrollment and the other two programs. Participants in any accelerated college credit program were matched with nonparticipants; however, there were not separate matched groups representing each type of program. Fifteen percent of students participated in more than one type of program. See appendix B and tables C14 and C15 in appendix C for more information.

Source: Authors’ analysis of data from Rhode Island Department of Education.

Implications

Like many states, Rhode Island has invested extensively in expanding access to accelerated college credit programs. Participation in Rhode Island’s programs has grown in recent years, with record numbers of participants attending these programs (PrepareRI, 2018; RIDE, 2020). This study has limitations (see limitations section); for example, the analyses cannot account for unobserved differences between students, such as differing levels of academic motivation, that might influence both a students’ decision to choose accelerated college credit courses and their likelihood of attending college. However, practitioners can use the data presented in this study to inform policy and legislative discussions about accelerated college credit programs in Rhode Island and beyond.

Implications for Rhode Island policymakers and education leaders

With this new information in hand, Rhode Island leaders can make evidence-based decisions regarding their efforts to expand access to all types of accelerated college credit programs. Since 2015, Rhode Island has devoted significant resources to expanding access to such programs through the PrepareRI Dual Enrollment Fund, which covers the costs for students taking dual enrollment coursework at the state’s three higher education institutions. As the state legislature considers funding decisions in the future and as RIDE leaders consider which types of accelerated college credit programs to promote, these findings can inform those decisions. Given the finding that participation in accelerated college credit programs led to positive high school and postsecondary outcomes, RIDE may consider expanding access to such programs.

RIDE may want to focus its accelerated college credit program expansion efforts on student populations that have relatively low participation rates, including racial/ethnic minority and economically disadvantaged students. Both concurrent enrollment and AP programs serve these student groups at disproportionately low rates, whereas dual enrollment programs reach a small number of students and schools overall.

For example, one potential strategy is to expand access to concurrent enrollment programs in urban schools, which are more likely than suburban schools to serve racial/ethnic minority and economically disadvantaged students. This study found that urban schools were less likely than suburban schools to offer concurrent enrollment programs. RIDE may want to investigate barriers keeping urban schools from offering concurrent enrollment courses. Before high school instructors can teach a concurrent enrollment course, program regulations require that they demonstrate qualifications similar to those of college instructors who typically teach the course and to be approved as adjunct faculty members at the higher education institution. Examining the characteristics of teachers who have this authorization, qualify for the authorization, or do not qualify—and disaggregating these results by school characteristics—could shed light on the reasons for differences between urban and suburban schools’ offerings in concurrent enrollment courses. For example, it may be the case that a higher proportion of urban school teachers do not have the education credentials to qualify as a postsecondary faculty member. Other potential barriers to investigate might include differences in turnover rates between urban and suburban teachers, which might make it more difficult to establish relationships with colleges, and differences in the level of administrator support across districts for establishing concurrent enrollment programs.

Although dual enrollment programs disproportionately serve racial/ethnic minority and economically disadvantaged students, the state may want to examine why so few students have participated in these programs. For example, the state could identify and address any logistical challenges impeding participation, such as lack of transportation to college campuses or inadequate technology access for online courses. Further efforts could also explore why dual enrollment courses are offered primarily through Rhode Island’s public two-year college and seldom by the state’s public four-year colleges.

Although students took AP tests at both urban and suburban schools at similar rates, the state could probe the causes of disproportionately lower access to AP tests among racial/ethnic minority and economically disadvantaged students. Finally, the state may want to further investigate the exploratory finding that AP test-taking is associated with larger gains in college enrollment rates than are the other two programs. Although all three programs were associated with positive student outcomes, there may be aspects of the AP course experience that merit further study.

Finally, to support ongoing monitoring and evaluation of accelerated college credit programs, the state may want to consider changes to its state-level data collection systems to provide more detailed information about AP course enrollment and about dual enrollment and credits earned at private postsecondary institutions in the state.

Implications for national audiences

Policymakers across the country can use these results, in combination with other studies, to make informed decisions about supporting student access to the accelerated college credit programs offered in their states. This study’s findings—that accelerated college credit programs are positively associated with improved high school graduation and college enrollment rates and with less need for developmental education courses—align with those of other research in the field (An, 2013; Davis, Smither, Zhu, & Stephan, 2017; Edmunds et al., 2017; Giani et al., 2014; Haxton et al., 2016; Struhl & Vargas, 2012). The evidence that these programs improve student outcomes could lead policymakers to consider ways to expand them. Although this study uses a sample from one of the nation’s smallest states, patterns of participation in Rhode Island’s accelerated college credit programs are similar to those found nationally, suggesting the report’s potential relevance to other states. Nationally, 46 percent of high school graduates earn credits in AP, International Baccalaureate, dual enrollment, or concurrent enrollment courses, compared with approximately 40 percent enrolling in such courses (excluding International Baccalaureate) in Rhode Island (U.S. Department of Education, 2019a). As was found in Rhode Island, a smaller share of students nationwide participates in dual enrollment courses offered on a college campus or online than

in concurrent enrollment courses located at the high school (U.S. Department of Education, 2019b).⁴ The underrepresentation of racial/ethnic minority students in such programs in Rhode Island also reflects national trends (U.S. Department of Education, 2019b).

Researchers can build upon these research findings in future studies, particularly by expanding on the study's exploratory finding that participation in each of three specific types of accelerated college credit programs—dual enrollment, concurrent enrollment, and AP test-taking—is related to improved chances of graduating from high school or enrolling in college. Few studies differentiate between dual and concurrent enrollment programs, so this finding is a contribution to the literature that can be explored further in other states.

Researchers may also want to investigate the effectiveness of accelerated college credit programs that are fully or partially online, given that during the 2019/20 and 2020/21 school years many dual, concurrent, and AP courses were delivered online because of school closures resulting from the coronavirus pandemic. In addition, many states may be considering making a shift to offer more courses online in the future, especially dual enrollment courses that would otherwise take place on a college campus.

In addition, more rigorous study of the effects of each program type, coupled with an examination of the costs of the three accelerated college credit programs in relation to their benefits, would be a valuable direction for future research, particularly to help Rhode Island policymakers allocate resources efficiently to support student success.

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⁴ National results reflect students in the 2009/10 grade 9 cohort who had received a high school diploma by the fall of 2013; data are from the nationally representative survey and transcript data collected through the High School Longitudinal Study of 2009.

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