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Dual Enrollment Momentum Metrics: Leading Indicators for Program Improvement

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Over the last two decades, the number of high school students taking college-level dual enrollment (DE) coursework has grown steadily, reaching 2.8 million in 2023-24 (Fink, 2025c). Although DE programs are widespread nationally, they are far from uniform in terms of design and implementation. For example, a student may participate in an intensive Early College High School program or simply take a single a la carte DE course to supplement their regular high school curriculum. State policies also vary across key elements of DE, including funding for colleges and school districts (Jenkins, Steiger, & Fink, 2025), out-of-pocket costs for students—DE is provided free of charge to students in about half of states (Zinth, 2025)—and academic eligibility requirements (Jamieson et al., 2022).

Despite this wide range of program designs and policy contexts, DE appears, on average, to increase students' post–high school chances of enrolling in college and earning a college credential (Schaller et al., 2023). Yet, while postsecondary outcomes of DE students are stronger than those of nonparticipants, the magnitude of this difference varies substantially by state (Velasco et al., 2024). Furthermore, research consistently illustrates gaps in DE access among student groups already underrepresented in postsecondary education, such as low-income students and students of color (Liu et al., 2026; Sparks et al., 2025; Xu et al., 2021).

To strengthen DE as an on-ramp to college and career, practitioners and policymakers need better metrics to track students' participation and early success in DE. The established metrics currently used are relatively simplistic; they typically capture whether or not a student takes a DE course rather than the amount or type of DE credits the student completes. Some states like Texas are implementing policies that reward specific amounts of DE credits earned in high school (with, e.g., incentives for K-12 districts when students complete 9 DE credits and incentives for colleges when students complete 15). Yet there is limited guidance on which credit accumulation thresholds best predict postsecondary outcomes. Identifying predictive metrics can help educators choose accurate and reliable leading indicators that are the most useful for assessing DE program improvements. Timely information on likely program outcomes is particularly important for continuous improvement efforts, as it allows practitioners and policymakers to observe how programmatic changes may produce short-term effects that lead to longer-term consequences—without waiting years for long-term data.

Research on community college students without prior DE experience indicates that "early momentum metrics" capturing first-year college credit accumulation (earning 6 or 12 credits in the first term, or 15 or 30 credits in the first year) and first-year college math and English completion reliably predict subsequent student credential completion and thus function as leading indicators of the effectiveness of institutional reforms (Belfield et al., 2019). Despite the widespread use of early momentum metrics in community college reform efforts (Jenkins, Lahr, et al., 2025), no study has yet adapted and validated similar metrics as leading indicators to support program improvement efforts in the DE context.

In this report, we introduce a set of DE momentum metrics that mark participation and academic progress of high school DE students, and we assess how reliably these metrics predict postsecondary success. We identify and test three types of metrics: threshold numbers of DE credits completed, gateway course completion in math and/or English, and college credential completion while in high school. We examine how each of these relates to three key postsecondary outcomes: college enrollment after high school, college completion by roughly age 24, and time to degree completion among bachelor's completers.

Using longitudinal student data from four anonymous states (called States A, B, C, and D), we validate whether each metric predicts success across different state contexts. For each state, we focus on the students who completed college-level courses while in high school at in-state public postsecondary institutions. Our analysis includes the students expected to graduate high school between 2015-16 and 2022-23. To assess the consistency of predictions across different populations, we disaggregate results by student gender and race/ethnicity, Title I high school status, and high school geographic locale.

Importantly, this is not a study focused on identifying the optimal "dosage" of DE. While related research uses impact evaluation to identify changes in outcomes attributable to specific DE credit amounts (e.g., 1–3 vs. 4–6 credits) (Liu et al., 2026; Lee & Villarreal, 2023), this study focuses on identifying predictive momentum metrics that educators can use as early indicators for program improvement. Thus, our analysis compares outcomes along binary benchmarks (e.g., 15+ credits compared to 0–14 credits, or 24+ credits compared to 0–23 credits) rather than assessing which specific dosage of DE leads to stronger outcomes.

As DE programs continue to expand, policymakers and practitioners should track not only access to DE but also the postsecondary momentum gained by students who participate in DE. The findings in this report can inform the selection of momentum metrics that best reflect the coursetaking patterns of their own DE students, aligned with educators' specific program goals.

State-by-State Context

DE programs operate within varied state policy contexts that shape student access and the resources available to K-12 and college partners for implementation. To situate the findings in this report, Table 1 offers a high-level overview of the characteristics of DE programs in each state during the study period (students in high school from 2011 through 2022). Summary information includes the growth of DE, participation rates, participation gaps for Black and Hispanic students, out-of-pocket student costs, eligibility requirements, state funding levels, and broad college enrollment and completion outcomes. Contextual factors influence who participates in DE and how much and what kind of support they receive.

Table 1. Summary of Each State's Dual Enrollment Context

	State A	State B	State C	State D
DE growth, 2011-2021[a]	52%	84%	166%	82%
DE Participation Rate: Percent of high school students who took a DE course (2021-22)[b]	5%	6%	10%	11%
Gap in participation rate: percentage point difference for Black students, Hispanic students[c]	2 pp, 2 pp	<1 pp, 3 pp	6 pp, 4 pp	3 pp, <1 pp
Cost to students/families for DE (2019)[d]	Local decision (some students pay)	Local decision (some students pay)	Free	Local decision (some students pay)
Eligibility requirements for academic DE (2022)[e]	Placement test	Placement test	Placement test required until 2022	Placement test
State funding amount to colleges for DE (2024)[f]	Low	Medium	Medium	Medium
Postsecondary enrollment rate of DE students within one year post high school, relative to the U.S. average[g]	Above	Above	Same/similar	Same/similar
Postsecondary completion rate of DE students within one year post high school, relative to the U.S. average[g]	Same/similar	Above	Same/similar	Below

[a] Authors' analysis of IPEDS fall enrollment data on undergraduates age 17 or younger, as reported in Fink (2025a).

[b] Fink (2025b).

[c] Fink (2025b).

[d] Zinth (2019).

[e] Education Commission of the States (2022).

[f] Jenkins, Steiger, & Fink (2025).

[g] March et al. (2024). We define outcomes relative to the U.S. average for all DE students in the 2015 entry cohort reported in National Student Clearinghouse data. Outcomes reported as "Same/similar" are within 2 pp of the average.

DE programs in States A and B, while growing steadily in the past decade, enrolled a relatively smaller share of high school students in 2021-22 (5% and 6%, respectively) compared to those in States C and D (10% and 11%). Gaps in participation rates for Black and Hispanic students were common across the states, with a smaller gap for Black students in State B and Hispanic students in State D. In State C, there was a high rate of DE growth in the past decade (166%), during which a state policy change effective in 2015 made DE free for students and families. In

the other states, whether or not students paid some out-of-pocket costs for DE was determined locally through MOUs between colleges and school districts. Across all the states, there was widespread use of standardized placement testing to meet student eligibility requirements for academic DE. Postsecondary enrollment and completion outcomes of DE students were above the national average in State B and above or at average in State A. Outcomes in States C and D were at or below the national average.

Dual Enrollment Student Characteristics

For each state, Table 2 shows the demographic characteristics of DE participants, information about their high schools, and the types of institutions where they took DE courses and enrolled in college after high school.

DE students were racially/ethnically diverse, though White students represented the majority in all states except State D, where 46% of participants were Hispanic and 38% were White. In the two states where we can identify low-income students—States A and D—just under half of DE participants were low-income (46% and 42%, respectively). Across all states, most DE students were women (58% on average).

DE students attended high schools in diverse settings across all four states. In States A and C, about one third of DE students attended rural high schools. State D showed the most even distribution of students across rural, town, suburban, and city locales. Roughly half of DE students in States A and C attended Title I high schools (schools serving predominantly low-income populations), while in State D this share was higher at 64%.

Most DE students took their coursework at community colleges. In States B and D, nearly all dual enrollment occurred through a community college (95% or more), whereas in States A and C, about 80% occurred through a community college.

After high school, most DE students who enrolled at in-state public postsecondary institutions did so through four-year institutions rather than community colleges, with the exception of participants in State B. Post–high school community college enrollment was highest in State B (49%) and lowest in State C (33%). In States A, B and D, where our data captures enrollments at in-state private institutions, 14%, 7%, and 6% of students enrolled in private four-year colleges. Our data does not include enrollments at out-of-state institutions; we cannot therefore account for students who enrolled in postsecondary education at out-of-state institutions.

Table 2. Characteristics and DE/Postsecondary Enrollment Sectors of DE Students

	State A	State B	State C	State D	Total
Gender					
Female	58%	60%	59%	57%	58%
Male	40%	40%	41%	43%	42%
Missing	2%	0%	0%	0%	0%
Race/ethnicity					
Asian	3%	6%	3%	5%	4%
Black	14%	19%	7%	8%	9%
Hispanic	6%	8%	4%	46%	29%
White	71%	55%	79%	38%	53%
Other	7%	12%	16%	3%	7%
Income					
Low-income indicator	46%	NA	NA	42%	43%
Title I high school					
Yes	46%	NA	49%	64%	58%
High school urbanicity					
Rural	31%	NA	31%	26%	28%
Town	16%	NA	16%	12%	13%
Suburban	8%	NA	45%	28%	30%
City	20%	NA	8%	34%	26%
Missing	25%	100%	0%	0%	12%
DE college sector (the first college of DE enrollment)					
Community college	79%	97%	80%	95%	90%
Public four-year institution	21%	3%	20%	6%	10%
Postsecondary enrollment sector					
Community college	34%	49%	33%	42%	41%
Public four-year institution	52%	44%	67%	52%	57%
Private non-profit four-year	13%	7%	NA	6%	7%
Private for-profit four-year	1%	0%	NA	0%	0%
Number of DE students	110,232	97,702	265,564	651,923	

Note. NA indicates that the characteristic is not available for the state. The Total column shows the weighted average for each characteristic across the four states.; when a characteristic is NA in a state, we exclude that state from the average calculation. Sample is restricted to DE students enrolled at public high schools in the state and expected to graduate in the 2015-16 to 2022-23 academic years. Data for the graduating cohorts 2021-22 and 2022-23 are not available for State A. We are not able to distinguish between public and private high school students in State B; the sample from that state thus includes students from any high school. Some percentage totals do not add to 100% due to rounding.

DE Students' Achievement of Momentum Metrics

Table 3 presents the percentage of DE participants achieving each DE momentum metric across the four states. (It also shows results for DE students' postsecondary outcomes, which we discuss in the next section.) The metrics fall into three categories: DE credit momentum shows the percentage of students who completed at least 6, 9, 12, 15, 24, or 30 DE credits; DE gateway momentum shows the percentage who completed college-level math, college-level English, or both while in high school; and college completion in high school shows the percentage who earned a certificate or associate degree before graduating from high school.

DE credit momentum. Across states, most students completed at least 6 DE credits, but completion rates diverged substantially at higher credit thresholds. In States C and D, roughly half of students completed at least 12 credits (45% and 54%, respectively), compared to only 21% in State B. These gaps widen further at the 24+ and 30+ credit thresholds, with State D consistently showing the highest completion rates.

DE gateway momentum. Students completed college-level English at higher rates than college-level math in all states, though completion rates varied widely. In States C and D, about 60% of students completed college-level English (61% and 57%, respectively), and roughly one third completed college-level math (32% and 30%). Students in States A and B had lower completion rates for both subjects—34% and 45% for English and 23% and 28% for math, respectively.

College completion while in high school. Earning a credential while in high school was rare across all states. State D had the highest rates, with 6% of students earning an associate degree and 2% earning a certificate. In the other three states, credential completion rates remained at 2% or below for both certificates and associate degrees.

Differences across subgroups. Across states, women achieved DE momentum metrics—for DE credit momentum, DE gateway momentum, and college completion—at slightly higher rates than men. Black students generally achieved the metrics at lower rates than the state average, whereas Hispanic students achieved the metrics at rates similar to the state average. We also find differences by high school location. Compared to the state average, students at rural high schools achieved momentum metrics at higher rates, while students at city high schools achieved them at lower rates (this excludes State B, for which we are not able to distinguish high schools and their characteristics).

Table 3. Momentum Metric Achievement and Postsecondary Outcomes of DE Students

	State A	State B	State C	State D	Total
Dual enrollment momentum metrics					
Share of students who did not complete any DE credits	4%	8%	4%	7%	5%
DE credit momentum					
6+ college credits	66%	55%	75%	79%	70%
9+ college credits	49%	32%	56%	62%	51%
12+ college credits	42%	21%	45%	54%	42%
15+ college credits	33%	13%	35%	43%	32%
24+ college credits	21%	6%	18%	26%	17%
30+ college credits	16%	4%	12%	17%	12%
DE gateway momentum					
College-level math	23%	28%	32%	30%	29%
College-level English	34%	45%	61%	57%	52%
College-level math and English	15%	17%	24%	23%	20%
College completion in high school					
Certificate completion	1%	1%	1%	2%	1%
Associate degree completion	1%	2%	2%	6%	2%
Postsecondary outcomes within one year post high school					
Any college enrollment	77%	57%	56%	70%	66%
Enrollment at a four-year institution	51%	29%	36%	42%	40%
Enrollment at a community college or	26%	28%	20%	36%	30%
College GPA in year 1	2.9	2.9	2.7	2.8	2.8
Postsecondary outcomes within two years post high school					
Retention year 1 to year 2	85%	84%	85%	85%	85%
Postsecondary outcomes within six years post high school					
Any credential completion	59%	42%	45%	47%	46%
Bachelor's degree completion	47%	32%	35%	35%	35%
Associate degree completion	18%	16%	15%	15%	15%
College certificate completion	5%	3%	6%	3%	4%
Time to degree completion among bachelor's completers	4.4	4.2	4.1	4.4	4.3
Time to degree completion among associate completers	2.7	3	2.8	3.1	3
Time to certificate completion among certificate completers	2.3	3.1	3	3	3

Note. The Total column shows the weighted average for each metric across the four states. College GPA in year 1 and retention from year 1 to year 2 are computed only among DE students who enrolled in the first year post high school.

DE Students' Postsecondary Outcomes

We select postsecondary outcomes that capture key student milestones from high school graduation through roughly age 24 (six years after expected high school completion). We measure whether DE students enrolled in college within the first year after high school, the average first-year college GPA among those who enrolled, retention from the first to second year of college among those who enrolled, credential completion (bachelor's degree, associate degree, or certificate) within six years among those who enrolled, and time to credential completion among those who earned a credential.

The bottom half of Table 3, shown above, provides descriptive statistics on these postsecondary outcomes across the four states. More than half of DE students enrolled in college within one year of high school completion, though enrollment rates were notably higher in State A (77%) and State D (70%). Students in these two states were also more likely to enroll at four-year institutions than at community colleges—51% versus 26% in State A, and 42% versus 36% in State D.

Average first-year GPA was similar across states, at 2.8, as was the year-to-year retention rate, which averaged 85%. State A students achieved the highest bachelor's degree completion rate at 47%—more than 10 percentage points higher than the bachelor's completion rates in States B, C, and D. Interestingly, State A's higher bachelor's completion rate was not paired with a lower time to degree completion.

Differences across subgroups. Women had stronger postsecondary outcomes than men, and this gender gap widened for outcomes measured six years after high school completion. We find similar results for Black and Hispanic students. For both groups, outcomes are slightly lower than the state averages in the first three years post high school, with the gap increasing after six years. Outcome differences by high school location are less consistent across locales and states. However, in State A, students from city schools had much lower six-year outcomes than the state average, particularly for credential completion.

How Well the Metrics Predict Postsecondary Outcomes

We conduct an econometric analysis to understand how well each DE momentum metric predicts students' postsecondary outcomes. Using the data from each state separately, we measure how much each momentum metric predicts each postsecondary outcome while accounting for student and high school characteristics that might also influence the relationship. Specifically, we account for student gender and race/ethnicity, the sector where the student took their DE courses (community college or a public four-year institution), characteristics of their high school that stayed constant over time, and year-to-year differences that affected all DE students in the state. This approach helps us determine whether each momentum metric is associated with changes in the postsecondary outcomes and the magnitude of the change, rather than simply reflecting differences in the types of students or schools participating in DE.

We examine how well each momentum metric predicts three key postsecondary milestones: enrolling in college within the first year after high school, earning any credential six years from expected high school completion (roughly at age 24), and completing a bachelor's degree. Prior research shows that enrolling in college soon after high school and that earning a credential by age 26 each significantly increase young people's chances of securing good employment with a living wage and achieving economic stability by age 30 (Carnevale et al., 2023). For our third milestone, we focus on time to bachelor's degree completion, as students who earn college credits in high school should finish their degrees faster, reducing both the time and cost of earning a bachelor's degree.

Table 4 provides findings on how well each momentum metric predicts college enrollment, credential completion, and time to bachelor's completion among DE students in each state. To make the results easier to compare across states, we present the findings as a percentage of each state's average outcome rather than as point estimates from the regressions. This approach accounts for the fact that DE students in different states may start with different outcomes due to variation in state policies and contexts.

Table 4. Predicted Percent Change in Postsecondary Outcomes by Momentum Metric

Declines in outcome — Improvements in outcome

DE momentum metric	College enrollment				College completion				Time to bachelor's			
	A	B	C	D	A	B	C	D	A	B	C	D
Outcome average	77%	56%	56%	70%	59%	42%	45%	47%	4.4	4.2	4.1	4.4
DE credit momentum												
6+ college credits	14%	11%	17%	21%	28%	25%	39%	47%	-4%	-3%	-6%	-6%
9+ college credits	8%	11%	11%	19%	25%	28%	38%	43%	-4%	-4%	-7%	-6%
12+ college credits	6%	11%	11%	18%	29%	29%	40%	43%	-4%	-6%	-8%	-7%
15+ college credits	2%	11%	10%	18%	30%	33%	42%	44%	-4%	-8%	-9%	-7%
24+ college credits	-4%	10%	8%	19%	34%	41%	48%	48%	-5%	-13%	-12%	-9%
30+ college credits	-9%	9%	7%	21%	38%	39%	54%	50%	-4%	-13%	-14%	-11%
DE gateway momentum												
College-level math	1%	6%	6%	17%	37%	25%	31%	36%	-4%	-5%	-7%	-6%
College-level English	5%	11%	13%	21%	28%	21%	36%	40%	-2%	-2%	-5%	-5%
College-level math and English	-4%	10%	9%	19%	35%	28%	38%	42%	-3%	-5%	-8%	-7%
College completion in high school												
Certificate	4%	9%	-10%	-7%	NS	53%	-93%	-27%	-6%	-13%	-9%	4%
Associate degree	20%	5%	-21%	22%	NS	35%	8%	34%	-8%	-23%	-10%	-14%

Note. Results based on estimates from OLS regressions of each momentum metric on each postsecondary outcome. Regressions control for student race/ethnicity and gender, DE sector, and high school and cohort characteristics. To facilitate cross-state comparability, point estimates are expressed as a percentage of the average outcome for all DE students in each state. All estimates shown are statistically significant at least at the 90% confidence level. Estimates that do not meet this threshold are denoted as NS (not significant).

To illustrate the interpretation of each metric's predictive power, consider State B's college enrollment rate and the momentum metric of completing at least 6 DE credits. The average enrollment rate among State B's DE students is 56% (shown in the top row). Our analysis finds that students who complete at least 6 DE credits are 6.3 percentage points more likely to

enroll in college, compared to students who do not complete 6 credits. This gain represents an 11% increase relative to the average (6.3 ÷ 56 = 0.11). Thus, completion of at least 6 DE credits predicts enrollment gains equivalent to 11% of the average enrollment rate for DE students in State B. We follow this approach to interpret the predictive power of each momentum metric for each postsecondary outcome.

We discuss the overall results and key takeaways below. In doing so, we highlight notable findings from subgroup analyses we conduct (not shown in tables) to examine the predictive power of each momentum metric among specific subgroups of students (female, male, Black, and Hispanic students) and by high school characteristics (Title I status and high school locale).

DE Credit Momentum

DE credit momentum metrics predict gains in postsecondary success across all four states. The magnitude of the gain predicted for college completion and time to bachelor's completion is larger for metrics with a higher credit threshold, but this is not the case for college enrollment.

College enrollment. Across states, earning DE credits predicts higher college enrollment rates after high school. However, the strength of this relationship varies depending on how many credits students earn. Completing at least 6 DE credits predicts gains equivalent to 11% to 21% of the average enrollment rate, making this threshold the strongest credit momentum predictor in States A, B, and C. While completing 9+ to 15+ DE credits also predicts positive gains in enrollment, the relationship is generally weaker. In State D, DE credit momentum across all credit thresholds (6+ to 30+ credits) consistently predicts enrollment gains of about 20%. Interestingly, in State A, completing 24+ DE credits predicts a 4% to 9% reduction in the college enrollment rate. This finding suggests that students in State A who accumulate a substantial number of credits may enter the workforce directly or enroll in private or out-of-state institutions, none of which we can observe in our data.

Credential completion. DE credit completion strongly predicts credential completion within six years post high school in all states—even minimal credit accumulation of 6+ DE credits predicts gains of at least one fourth of the average state completion rate. In State B, completion of at least 6 DE credits predicts gains of 25% of the completion rate, rising to 41% for students who complete at least 24 DE credits. We find similar patterns in States A and C, with the predictive power ranging between 25% to 38%, and 38% to 54%, respectively. Credit momentum metrics are similarly strong predictors in State D, though the relationship dips slightly at the 9+ to 15+ credit thresholds before rising again when students earn 24+ DE credits.

Time to bachelor's completion. DE credit completion predicts a reduction in time to bachelor's degree completion among completers, but the relationship is weaker than for the enrollment and credential completion outcomes. In State B, completing at least 6 DE credits predicts finishing a bachelor's degree 3% faster than the average time for DE students who complete the degree. This reduction increases to 13% for students who complete 24+ or 30+ DE credits. Although meaningful, the time savings are modest at the lowest thresholds. States C and D show similar patterns. Notably, in State A, the time to bachelor's degree completion remains constant across credit thresholds, at about a 4% reduction.

Differences across subgroups. Across the four states, we find that DE credit completion predicts higher enrollment rates among men than among women. This gender difference narrows for time to bachelor's completion, suggesting that credential completion benefits

among women may take longer to accrue. We also find differences between Black and Hispanic students. For example, in State D, we find that credit completion metrics predict higher enrollment rates among Hispanic than among Black students. We observe similar gaps in States B and C. However, these differences are statistically insignificant when measuring time to bachelor's completion among completers. We do find that DE credit completion metrics are stronger predictors of the outcomes among students at Title I schools. We do not find differences in the results by school locale.

DE Gateway Momentum

Gateway course completion strongly predicts postsecondary outcomes, though patterns differ depending on whether students complete either math or English. Completion of college-level English is a stronger predictor of postsecondary enrollment, while completion of college-level math or both college-level math and English is a stronger predictor of credential completion and of faster bachelor's completion.

Across states, college-level English completion predicts enrollment gains of between 6% and 21% of the average enrollment rate of DE students in each state, consistently outperforming math as a predictor. For credential completion, English and math each predict a gain of at least one fifth of the average completion rate, though math is a stronger predictor in two of the four states. Across all states, math predicts a 4% to 7% faster time to bachelor's completion, while English predicts a gain of 2% to 5%.

Completion of both college-level math and English is generally the strongest predictor of credential completion. College-level English is the strongest predictor of college enrollment, and college-level math completion is the strongest predictor of decreased time to bachelor's completion. Notably, in State A, completion of both math and English predicts a 4% reduction in the average college enrollment rate. This is consistent with our findings on DE credit momentum metrics in this state, which suggest that students in State A who are completing more intensive DE coursework are potentially pursuing postsecondary education in private or out-of-state institutions or joining the workforce directly post high school, which we cannot track in our data.

Differences across subgroups. Across all states, DE gateway completion metrics are stronger predictors of higher college enrollment among men than among women. However, evidence from States C and D suggests that this gender difference reverses for time to completion among bachelor's completers: DE gateway completion—especially math—predicts larger reductions in time to bachelor's completion for women than for men. Findings for racial/ethnic differences are less precise in most states we studied due to lower representation of some subgroups, though results from State D, which is larger and more diverse, suggest that DE gateway completion metrics are stronger predictors of college enrollment among Hispanic students than among Black students. DE gateway metrics are stronger predictors of enrollment, and reduced time to bachelor's completion among Title I high school students, compared to estimates for all DE students in the state.

College Completion in High School

How predictive earning credentials while in high school is of subsequent postsecondary outcomes varies substantially depending on whether students complete a certificate or an associate degree. Completing a certificate while in high school predicts gains in college enrollment rates in two states, gains in college completion rates in only one state, and shorter time to bachelor's

completion among completers in three states. In contrast, completing an associate degree while in high school predicts gains in college enrollment in three states, gains in college completion in three states, and reduced time to bachelor's completion among completers in all states.

The magnitude—and direction—of the predicted gains vary greatly across states. For example, in State B, completion of a certificate while in high school predicts a gain in college enrollment of 9% and a gain in college completion of 53%. In State C, it predicts a decline in college enrollment of 10% and a decline in college completion of 93%.

Differences across subgroups. In States B and D, completion of a college credential in high school predicts higher subsequent college enrollment rates for men than for women. This gender gap narrows for time to bachelor's completion among completers. Estimates for Black and Hispanic students are less consistent across states, as are estimates across school locales and Title I school status.

Summary of Findings

The majority of the DE momentum metrics we test predict favorable changes in college enrollment, completion, and time to bachelor's completion. However, the magnitude of the predicted gains varies across metrics, outcomes, and subgroups:

- Higher DE credit thresholds predict higher credential completion and a larger reduction in time to bachelor's degree completion. However, for college enrollment, lower credit thresholds are stronger predictors in three of the four states.
- DE gateway course completion metrics predict college success, but college-level English is a stronger predictor of college enrollment, whereas college-level math, or math and English combined, are stronger predictors of college completion and reduced time to a bachelor's degree.
- The relationship between credential completion while in high school and postsecondary outcomes is mixed across states. Certificate completion while in high school shows a negative or insignificant relationship with college completion in three states, and a mixed relationship with college enrollment and time to bachelor's completion. Associate degree completion while in high school tends to be a more consistent predictor of increases in college enrollment, completion, and reduced time to bachelor's completion.
- All sets of DE momentum metrics predict larger enrollment gains for men than for women, though this gender gap narrows for college completion and time to bachelor's completion.
- Differences between Black and Hispanic students are less consistent or statistically insignificant; however, results from State D suggest that DE credit momentum and gateway course completion predict larger enrollment gains for Hispanic than for Black students, though this gap disappears for time to bachelor's completion.
- In States A, C, and D, DE credit and gateway momentum metrics predict larger gains among Title I high school students than among DE students in the state overall.

While the DE momentum metrics we test show predictive power in terms of subsequent postsecondary milestones, there are differences—as well as some similarities—across the four states in the average coursetaking patterns and postsecondary outcomes of DE students:

- DE students accumulate more credits in some states than others. DE Students take college-level English at a higher rate than they take college-level math. College credential completion while in high school is low across states, especially completion of certificates, which is consistently 2% or lower.
- Postsecondary outcomes of DE students vary across states: College enrollment ranges from 56% to 77%, credential completion from 42% to 59%, and bachelor's completion from 32% to 47%. Among DE students who enroll in college after high school, retention rates, average first-year GPA, and time to credential completion among completers are similar across states.

Using Momentum Metrics for Assessing Program Improvement

Tracking all 11 of the DE momentum metrics may be impractical for practitioners and policymakers. Instead, educators may want to select a small subset of the metrics to prioritize for reporting and for goal setting aimed at program improvement. Selection of these metrics should be grounded in data availability and state context in which DE programs are implemented. And similar to metrics on participation in DE, momentum metrics should be disaggregated by student subgroups to better identify gaps and plan improvements to better support students experiencing disparities in postsecondary momentum gained through dual enrollment.

The specific metrics selected for regular tracking and for the support of program improvement efforts should align with how practitioners and policymakers envision the purpose and goals of their DE programming:

- **College access goals.** Lower credit thresholds and college-level English metrics are strong predictors of postsecondary enrollment, making these suitable metrics when the purpose is to assess which students are on track and which are falling behind in terms of accessing college.
- **College completion and affordability goals.** Higher credit thresholds and college-level math metrics are strong predictors of college completion and reduced time to bachelor's degree, making these suitable metrics when the purpose is to assess students' chances of completing a credential and to improve affordability via reduced time to completion.
- **Broad goals.** When DE programming has a broad set of goals, a balanced set of metrics—such as 6+ credits earned, 15+ credits earned, gateway English completion, and gateway math completion—can be ideal. Selection of specific metrics may reflect major DE practices implemented in the state or key policy goals, such as having students accumulate a minimum of DE credits or having students complete a credential while in high school. Practitioners can use the findings in this report to see how the metrics they select predict postsecondary outcomes in the four states we examine.

Regardless of which metrics practitioners and policymakers use, findings from this four-state analysis show that DE momentum metrics are reliable predictors of students' subsequent postsecondary outcomes. Educators working to strengthen the impact of DE programs for their students should therefore consider analyzing similar metrics locally and using them as leading indicators to help assess the effectiveness of program improvement efforts.

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