
Advanced Placement Strategy

A Framework for Identifying School-Level Barriers to AP Success

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Preface

This report is directed at counselors, teachers, and leaders in schools and districts. It aims to help these individuals to think strategically about Advanced Placement coursework, one of several ways that high schools can provide their students exposure to rigorous coursework and the chance to earn post-secondary credit. We hope that the framework and analysis presented here can help schools and districts use available data in conjunction with what we know about improving AP results to create a coherent strategy for increasing the AP success of their students.

Acknowledgments

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INTRODUCTION

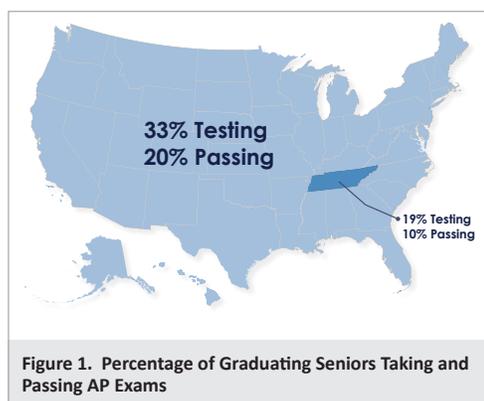
In 2013, Tennessee counted nearly 7,000 students in the senior cohort whose academic skills when they entered high school suggested they were on track to earn college credits through Advanced Placement (AP) exams. Yet just over half of these students actually graduated with an AP credit, and less than a third of the economically disadvantaged students made the grade. What happened?

The following report details real issues schools encounter when moving academically prepared students along the AP pipeline, from access to success. This is not a story of student performance declines. Rather, it is one of missed opportunities for school-level interventions, in the form of additional course offerings, more targeted student counseling, or greater financial support for AP students. By using student-level data to highlight particular issues that schools face, we hope to create a framework that allows schools and districts to design targeted solutions to their individual challenges. While AP is only one of several options for allowing high school students to earn post-secondary credit, the framework applied to AP in this report could serve equally well for considering other options such as dual credit, dual enrollment, or International Baccalaureate programs.

AP Trends across Tennessee

The Advanced Placement (AP) program, offered by the College Board, provides an opportunity for students to experience college level curriculum and coursework while still in high school. If a student succeeds on a subject-specific AP exam, generally defined as scoring a 3 or higher out of a total of 5 potential points, he or she is eligible to receive credit for college coursework. Research on the effects of AP course-taking on long-term student outcomes suggests that AP coursework, especially among students who are academically qualified, increases the likelihood that students go to college, earn high marks while in college, and eventually graduate from a four-year institution.¹

In Tennessee, as in the nation as a whole, the number of students taking AP exams has grown over the last decade. However, the state still lags considerably behind the rest of the country in AP participation and success. Nationwide, 33 percent of students in the graduating class of 2013 took at least one AP exam during their high school career and 20 percent earned at least one passing score. In comparison, 19 percent of Tennessee seniors took at least one exam at some point during their schooling, with a success rate of just 10 percent (Figure 1).



1. See (a) Jackson, Kirabo C. (2010). A little now for a lot later: A look at a Texas Advanced Placement Incentive Program. *The Journal of Human Resources*, 45(3), 591; (b) Jackson, Kirabo C. (2010). Effects of an incentive-based high school intervention on college outcomes. National Bureau for Economic Research Working Paper 15722. <http://www.nber.org/papers/w15722>; (c) Scott, P., Tolson, H., & Yi-Hsuan, L. (2010). Assessment of advanced placement participation and university academic success in the first semester: Controlling for selected high school academic abilities. *Journal of College Admission*, (208), 26-30; (d) Keng, L. & Dodd, B. G. (2008). A comparison of college performances of AP and non-AP student groups in 10 subject areas (College Board research report no. 2008-7). New York, NY: The College Board. For a discussion of the differential effects of AP access on AP-ready students versus non-AP-ready students, see: (a) Geiser, S., & Santelices, V. (2004). The role of Advanced Placement and honors courses in college admissions (Research & Occasional Paper Series: CSHE.4.04). Berkeley: University of California and (b) Hallett, R, E., & Venegas, K. M. (2011). Is increased access enough? Advanced placement courses, quality, and success in low-income urban schools. *Journal for the Education of the Gifted*, 34(3), 468-487.

There is an equally stark contrast within Tennessee between economically disadvantaged (ED) students and their peers. Economically disadvantaged students take and pass only around two-thirds as many AP exams as non-economically disadvantaged (non-ED) students across the state. This trend has held constant over the past five years (Figure 2).

Understanding the barriers to AP success in Tennessee requires understanding Tennessee students' progress along the AP pipeline (Figure 3). In the following pages of the report, we begin by charting the AP pipeline at the state level, following student progress from initial preparation to AP access to test completion and college credit. We then focus in on individual school issues, highlighting the extensive variation across high schools around the state.

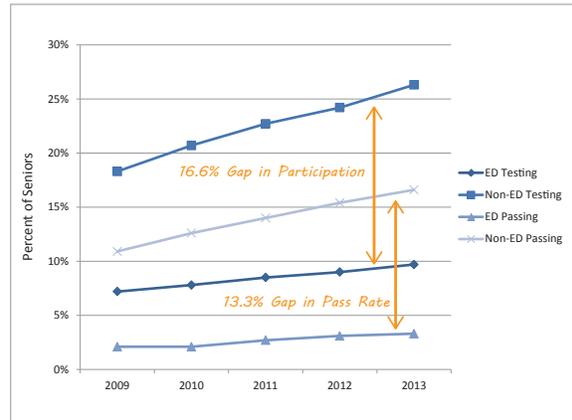


Figure 2. Tennessee AP Participation and Success Rates, by Economically Disadvantaged (ED) status

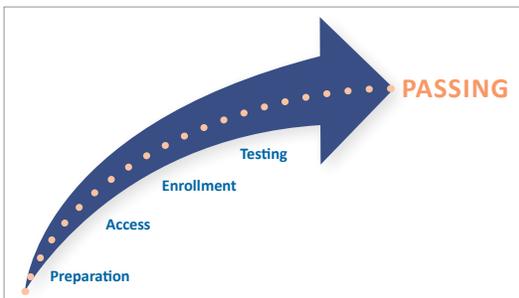


Figure 3. Student Progress along the AP Pipeline

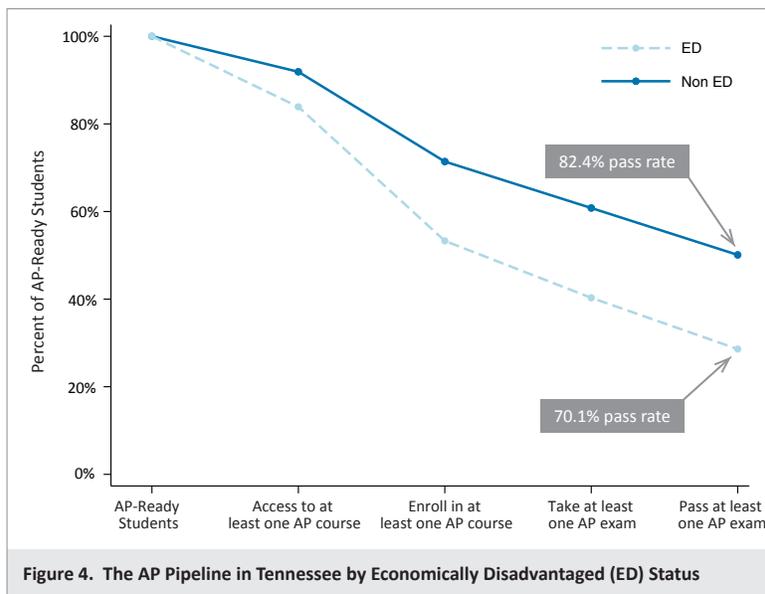
The AP Pipeline

Following the lead of the College Board, which offers expectancy tables predicting a student's likelihood of passing an AP exam given his or her performance on the PSAT, we use eighth grade TCAP scores as a measure of student preparation for high school AP exams (see Appendix A for expectancy tables using Tennessee achievement data). Overall, the relationship between the eighth grade TCAP and AP success is quite strong. Within the group of AP test-takers, more than 80 percent of those who scored at or above the 90th percentile on their eighth grade TCAP passed at least one AP exam. In contrast just 10 percent of students who scored at the 50th percentile on their eighth grade TCAP exam passed at least one AP exam. Across the state, 53 percent of test-takers in the 2013 cohort passed at least one exam.

While it is important to know about the performance of students who currently take AP, it is also critical to growing the number of college ready students in the state that we know what types of students could be taking AP that are not currently. In our analysis, based on their likelihood to pass

Early Post-Secondary Opportunities

Advanced Placement represents one example of rigorous high school coursework. Other opportunities, such as Dual Enrollment, International Baccalaureate and Dual Credit coursework, can expose students to rigorous curriculum and provide the opportunity to earn postsecondary credit. Although this paper addresses ways to think about a school's AP strategy, it is also important to consider other ways schools provide students exposure to early post-secondary opportunities. As AP courses are just one of many early postsecondary opportunities schools can offer students, we encourage you to examine what other rigorous courses might fit the needs of your students.



an AP exam, we define AP-ready students as those who scored at or above the 90th percentile point on their eighth grade TCAP exam. While this cutoff is informed by the research, it does not indicate that students who test below this threshold cannot achieve passing scores on AP exams by late high school. However, the cutoff provides a useful tool for analysis since it allows us to track a group of students that we feel confident could perform at high levels on AP exams if given the opportunity.

Figure 4 displays how AP-ready students in the 2013 senior cohort fared along the AP pipeline. Broadly speaking, AP-ready students are in schools where they have access to AP courses. However, not all AP-ready students with AP access enroll in these courses. Furthermore, enrolled students are not always sitting for the tests. However, when they take the AP tests, they usually pass. Around 92 percent of these students were enrolled in schools where they had broad access to AP courses, with the number dropping to 83 percent for economically disadvantaged students. But only 70 percent of all the students and only around half of the economically disadvantaged students actually enrolled in these courses. The numbers dropped still further when it came to actually sitting for AP exams. Thus, even though over 80 percent of the students who sat for an AP exam passed the test, the state was left in 2013 with only half of the AP-ready students and less than a third of economically disadvantaged AP-ready students in the cohort actually earning college credits. At every point along the pipeline, the

What This Analysis Tells Us—and What It Does Not

The analysis presented in this paper provides one lens for schools and districts to use when examining their data. Viewing a school's data through this lens can help schools diagnose the particular challenges they face in increasing AP success. If schools are not moving those students predicted to succeed in AP courses along the pipeline, it is likely that other students are encountering challenges to AP participation and success as well. This analysis is not meant to imply which students to exclude from AP classes. Prior achievement is one of several factors that impact student success in AP coursework. It is important for schools to consider a wide range of influences when making course placement decisions. For example, this analysis does not examine the role of instruction, a very important variable that likely impacts success rates.

percentages dropped, and at every point along the pipeline, the gap widened between economically disadvantaged students and their peers.

If this picture held constant at the school level, we would be justified in viewing the current state of AP in Tennessee as one requiring transformative intervention along every point in the pipeline. But Figure 4 collapses data from around 350 high schools to create a state-level picture. When we look at the AP pipeline in individual schools, a very different picture emerges.

Instead of a single set of schools that share all the problems documented in Figure 5, we find that schools face different types of challenges moving AP-ready students along the AP pipeline. To expand AP in Tennessee, we need to find solutions tailored to the problems faced by different schools. So what are these issues?

Differentiated Intervention

We regularly ask teachers to differentiate their instruction by using student data to plan lessons that cater to individual student needs. Yet too often our policy solutions and interventions are crafted as one size fits all policies that fail to differentiate based on the highly variable data coming from individual schools and districts. Just as teachers need to understand the unique challenges of each student, states and districts must recognize the particular needs of different schools and classrooms. In this memo, we construct a framework for identifying the different challenges that schools face if they wish to increase the number of students taking and passing AP exams.

AP CHALLENGES AT THE SCHOOL LEVEL

In this section, we document the six major AP problem areas that we find in Tennessee high schools. Not every school in the state falls into one of these categories – some schools are quite successful at moving students along every point of the AP pipeline – and some schools fall into multiple categories. The intent here is to provide a method of analysis that suggests a clear set of policy solutions for determining how to raise AP success in any given school in the state.

Each issue is accompanied by a graph or diagram showing data from a real school in Tennessee. Thus, these graphs both offer actual depictions of the AP pipeline in a given school as well as examples or models of the types of patterns that we would find if we were to look closely at any of the schools that fall into the category.

If you are a school or system director hoping to build up the AP program in your school or schools, we encourage you to work with the analysts in your CORE office to determine where your schools fall on this list and to design interventions that address the identified issues.

Category

1

Low Preparation

A high school with a low preparation issue has less than nine AP-ready students reach its senior class.

Schools whose students do not have the academic skills to be successful in AP courses may need to address fundamental student achievement issues before looking to grow their advanced offerings. Across the 347 high schools in the state, 167 schools lack the critical mass of AP-ready students that might justify the creation of new AP courses. While 20 of these are simply small schools that graduate few students overall, 147 are schools with large numbers of students but few who have scored in the top range of TCAP for the state. For the schools in the latter category, an AP strategy must begin long before ninth grade and target the feeder schools that send underprepared students into these high schools. We leave these schools out of the subsequent analysis, focusing for the remainder of this memo on schools that have AP-ready students but fail to move them forward along the AP pipeline.

Category 2

Low Access
A high school with a low access issue provides little to no opportunity for students to enroll in AP coursework, offering either no AP courses or only coursework in a single subject area.

One major challenge that leads to lower AP success in Tennessee is access. Out of 180 high schools in Tennessee with sufficient AP-ready students to justify course offerings, 46 or one-quarter of the schools fall into the low access category. Figure 5 illustrates the pattern for one such school. This school has a critical mass of AP-ready students but offers no AP courses to these students. Although many of these schools are located in smaller, rural districts, nine of these high schools are located in districts with enrollments larger than 10,000 students.

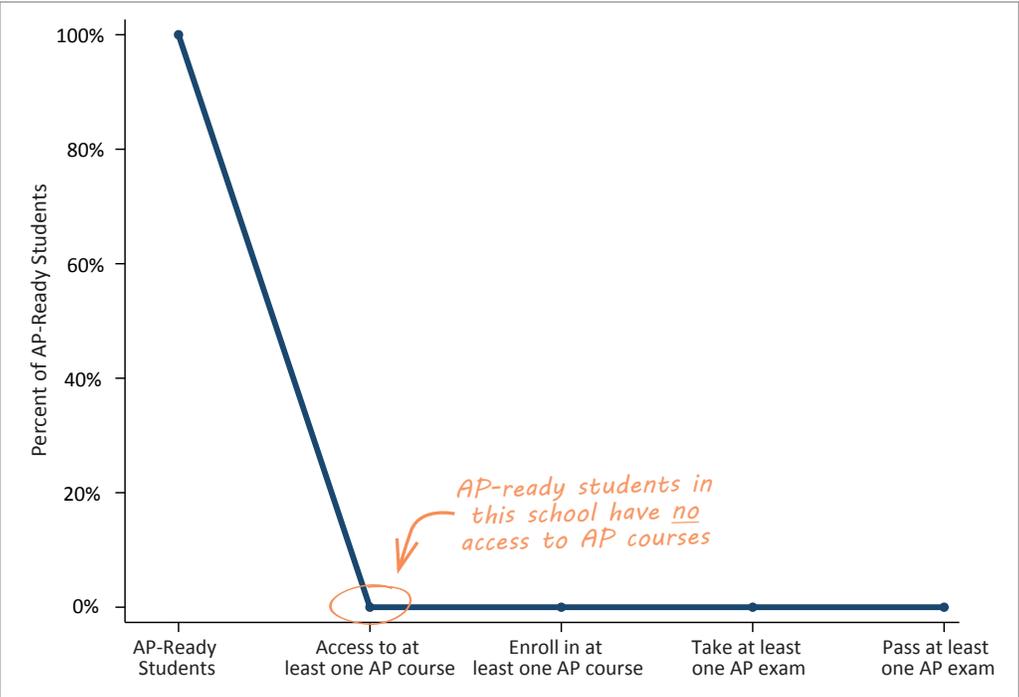


Figure 5. An Example of the AP Pipeline in a High School with No Access to AP Coursework

No Access High School, shown here in the graph, provides a clear example of a high school that offers no AP coursework. This school, located in a small, rural county, serves less than 700 students. It is the only high school in its district and is located approximately 70 miles away from a large metropolitan area. Roughly half of its student population is classified as economically disadvantaged. In 2013, the school’s senior class included 20 AP-ready students, with half of these qualifying for free or reduced-price lunch. But since the school offers no AP classes, these 20 students did not have access to the rigor of AP coursework or the opportunity to earn college credit through this route.

Category
3

Low Enrollment

A high school with a low enrollment issue has a critical mass of AP-ready students and offers AP courses, but less than 50 percent of the school's AP-ready population enrolls. This occurs in at least two subject areas.

Among the 134 high schools that provide sufficient access in the form of robust AP course offerings to their students, 66 schools do not enroll the majority of their AP-ready students in these courses. Figure 6 depicts the AP pipeline of one school in the state that is struggling with low AP-ready student enrollment. Although this school offers AP courses, only 38 percent of AP-ready students enroll in at least one course. Encouragingly, those who do enroll sit for the exam and the vast majority of those students make a passing score.

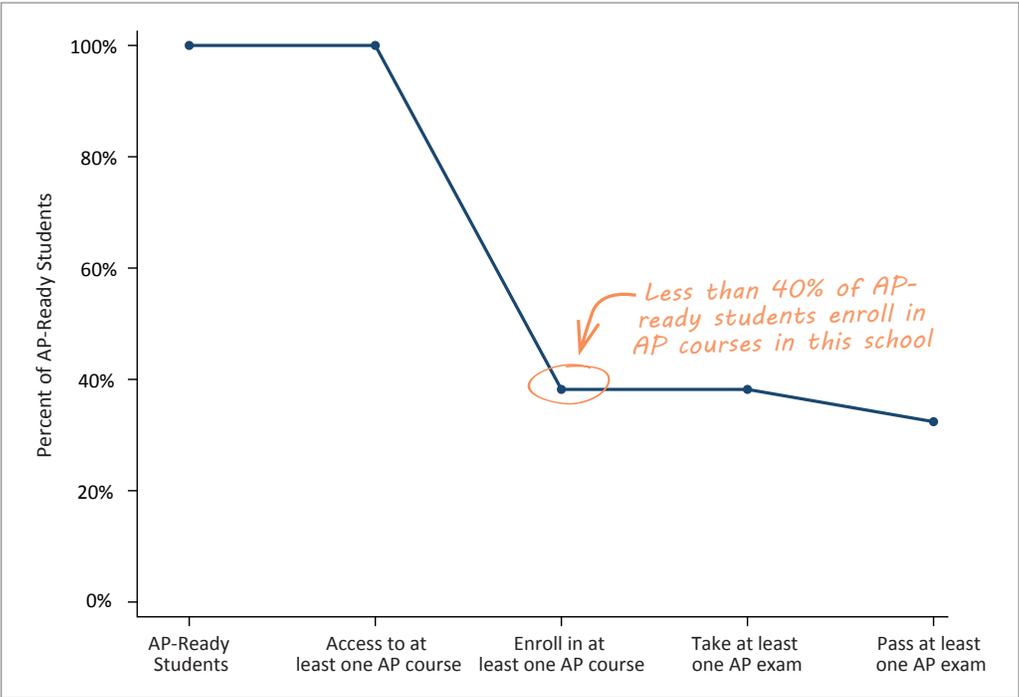


Figure 6. An Example of the AP Pipeline in a High School with Low AP-ready Student Enrollment

Low Enrollment High School, shown in the graph here, provides a clear example of a school that offers AP coursework but does not enroll the majority of their AP-ready students in these courses. This school, located in a large metropolitan area, serves over 1,900 students. Approximately 41 percent of its student population is classified as economically disadvantaged. In 2013, the school's senior class included 68 AP-ready students, with 17 of these students qualifying for free or reduced-price lunch. In 2013, the school offered eight AP courses, including at least one in math, English, science, and social science. Although it offered a sufficient number of AP courses, only 38 percent of its AP-ready seniors enrolled in at least one AP course during their high school career, meaning only a small percentage of these students had the opportunity to experience the rigor of AP coursework and the opportunity to earn college credit via this route.

Category
4

Differential Enrollment

A high school with a differential enrollment issue is a school where AP-ready, economically disadvantaged students enroll in AP classes at a rate 10 percentage points below that of their AP-ready, non-economically disadvantaged peers in at least two subject areas.

Sixty-six Tennessee high schools fall into the differential enrollment category. In schools with a differential enrollment problem, low income students whose test scores suggest that they are just as likely to succeed as their more affluent peers enroll in these classes at vastly different rates. Thirty-six of these 66 schools are ones that also have low overall enrollment of all AP-ready students (category 3). However, the other 30 schools are schools that successfully enroll large percentages of AP-ready students but do not achieve the same success with equally prepared economically disadvantaged students. Figure 7 depicts the AP pipeline at a school with an enrollment differential problem. As this figure illustrates, although schools have sufficient numbers of both ED and non-ED AP-ready students and offer AP courses, they enroll far fewer AP-ready ED students in AP coursework than their non-ED peers.

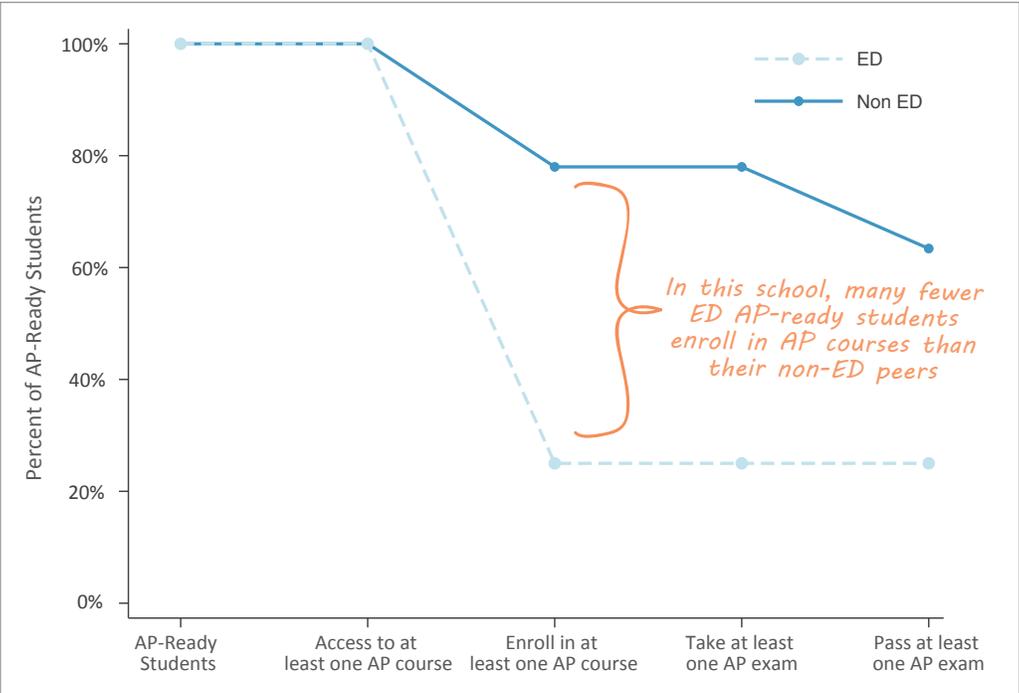


Figure 7. An Example of the AP Pipeline in a High School with Differential AP-ready Student Enrollment

Differential Enrollment High School, shown in the graph here, provides a clear example of a school that offers AP coursework but enrolls economically disadvantaged AP-ready students at different rates than their non-economically disadvantaged counterparts. This school, located in medium sized district that includes several high schools, serves over 1,400 students. Approximately 28 percent of its student population is classified as economically disadvantaged. In 2013, the school’s senior class included 49 AP-ready students, with 8 of these students qualifying for free or reduced-price lunch. In 2013, the school offered 11 AP courses, including at least one in math, English, science, social science, and foreign language. Although the majority of its AP-ready students took at least one AP course, only a quarter of its economically disadvantaged AP-ready seniors enrolled in at least one AP course during their high school career. This means only a small percentage of these students had the opportunity to experience the rigor of AP coursework and the opportunity to earn college credit via this route.

Category
5

Low Test-Taking
A low test-taking high school is a school where less than two-thirds of AP-ready students who enroll in an AP class actually sit for the AP test. This occurs in at least two subject areas.

Fifty-five high schools have large percentages of AP-ready students who fail to sit for AP tests and thus lose the opportunity at college credit that the AP program offers, even though these students enroll in and complete AP courses offered at their schools. Figure 8 profiles one such school that offers AP courses and enrolls the majority of AP-ready students in these courses but only moves 52 percent of those students from enrollment to testing. This pattern is not entirely surprising, since AP tests cost up to \$89 per test. However, this issue is also one that is easily approachable through test fee subsidies and better communications about the potential returns to earning college credit. A series of grants provided by the state and the College Board already cut down considerably on the cost of tests for low-income students, as we describe in the following section.

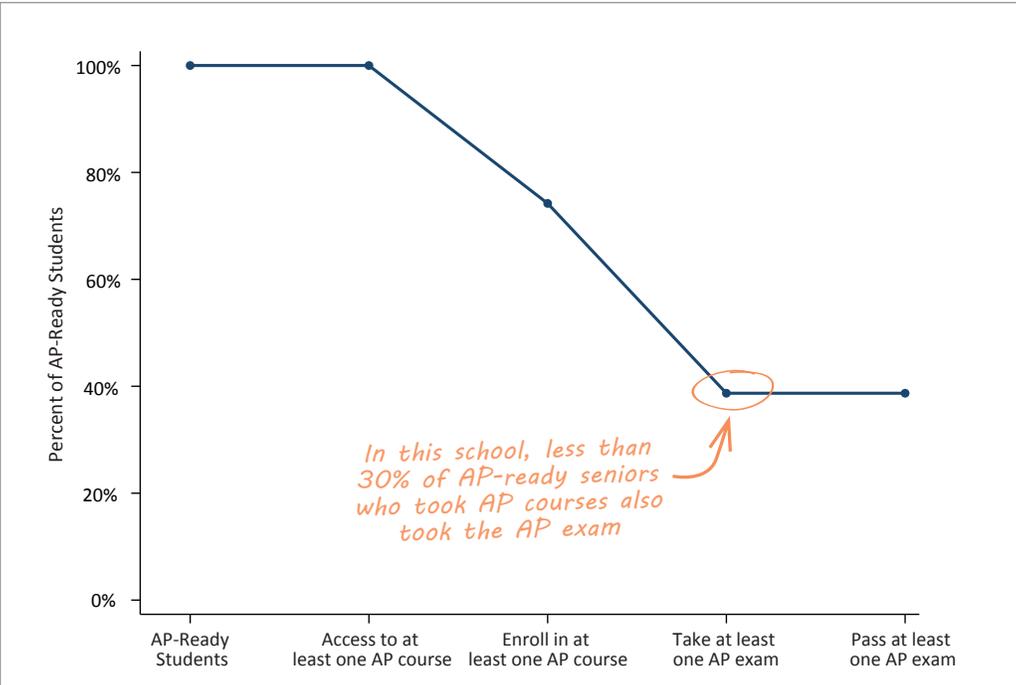


Figure 8. An Example of a School with Low AP-ready Student Testing

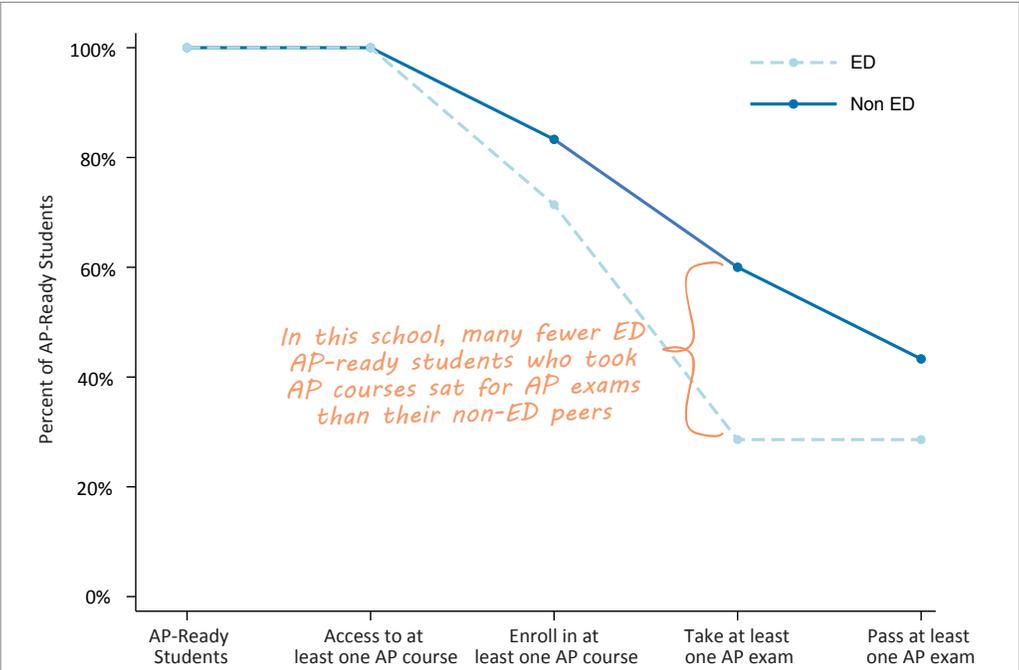
Low Test-taking High School, shown here in the graph, provides a clear example of a school that enrolls the majority of their AP-ready students in AP coursework but does not move these students to the test-taking point. This school, located in a medium sized suburban district in a large metropolitan area, serves more than 1,300 students. Approximately one fifth of its student population is classified as economically disadvantaged. In 2013, the school’s senior class included 31 AP-ready students, with 5 of these students qualifying for free or reduced-price lunch. In 2013, the school offered four AP courses, including at least one in math, English, and social science. Although it enrolled a sufficient number of AP-ready students in these courses, only 28 percent of its AP-ready seniors who enrolled in at least one AP course sat for the AP exam. This means only a small percentage of these students had the opportunity to earn college credit from their coursework.

Category 6

Differential Test-Taking

A differential test-taking high school is a school where AP-ready, economically disadvantaged students who enroll in AP courses take AP exams at a rate 10 percentage points below that of their enrolled AP-ready, non-economically disadvantaged peers in at least two subject areas.

Our final category captures the 30 high schools across the state with significant differentials between the percentage of economically disadvantaged students and non-economically disadvantaged students who move from enrollment to testing. Thirteen of these 30 schools also had testing problems for all their AP-ready students, but this problem was magnified for the low-income students in these schools. Figure 9 depicts one such school, where 72 percent of enrolled non-ED students sit for the AP exam compared to only 40 percent of their ED counterparts. Interestingly, the total set of subsidies available to low-income students brings the testing fee down from \$89 per test to only \$10 each, suggesting that the barrier at this point might have more to do with the school’s failure to make these subsidies widely known than with the actual cost of the test.



In this school, many fewer ED AP-ready students who took AP courses sat for AP exams than their non-ED peers

Figure 9. An Example of a School with Differential Testing of AP-ready Students Dependent on ED Status

Differential Test-taking High School, shown in the graph above, provides a clear example of a school that enrolls the majority of its AP-ready students in AP coursework but moves economically disadvantaged AP-ready students to the testing point at different rates than their non-economically disadvantaged counterparts. This school, located in a medium sized suburban district in a large metropolitan area, serves more than 1,500 students. Approximately 38 percent of its student population is classified as economically disadvantaged. In 2013, the school’s senior class included 37 AP-ready students, with 7 of these students qualifying for free or reduced-price lunch. In 2013, the school offered 12 AP courses, including at least one in math, English, science, and social science. Although the majority of its AP-ready students took at least one AP course, only 29 percent of its economically disadvantaged AP-ready seniors who enrolled in at least one AP course took the AP exam. This means only a small percentage of these students had the opportunity to earn college credit from their coursework.

NEXT STEPS

As we have outlined in this paper, there are several distinct challenges schools face when moving students along the AP pipeline. Given that not all schools face the same challenges, we believe that no one size fits all approach can increase AP success. We hope that this framework helps schools, districts, and other stakeholders think strategically about the pipeline and where schools need help to best serve their students. If you are a school or system director hoping to build up the AP program in your school or schools, we encourage you to work with the data analysts in your CORE office to determine where your school or schools fall on this list and to design interventions that address the identified issues in order to raise your students' success.