STRATEGIC DATA PROJECT

SDP FELLOWSHIP CAPSTONE REPORT

Exploring Post-Secondary Attainment: Applying the Strategic Data Project Toolkit Analytic Process at Elizabeth Public Schools

Monica Martinez, Elizabeth Public Schools

SDP Cohort 3 Fellow

SDP Fellowship Capstone Reports

SDP Fellows compose capstone reports to reflect the work that they led in their education agencies during the two-year program. The reports demonstrate both the impact fellows make and the role of SDP in supporting their growth as data strategists. Additionally, they provide recommendations to their host agency and will serve as guides to other agencies, future fellows, and researchers seeking to do similar work. *The views or opinions expressed in this report are those of the authors and do not necessarily reflect the views or position of SDP or the Center for Education Policy Research at Harvard University.*

Abstract

This report highlights the process of completing the Strategic Data Project (SDP) college-going diagnostic at Elizabeth Public Schools (EPS), a mid-size urban district in New Jersey. The analysis followed all first time 9th graders in 2007-08 and 2008-09 in an effort to document some of the factors associated with staying on-track to graduate, completing high school, and enrolling in college. These results will help district leadership better identify students who may be at risk for not graduating on time, as well as inform larger policy changes.

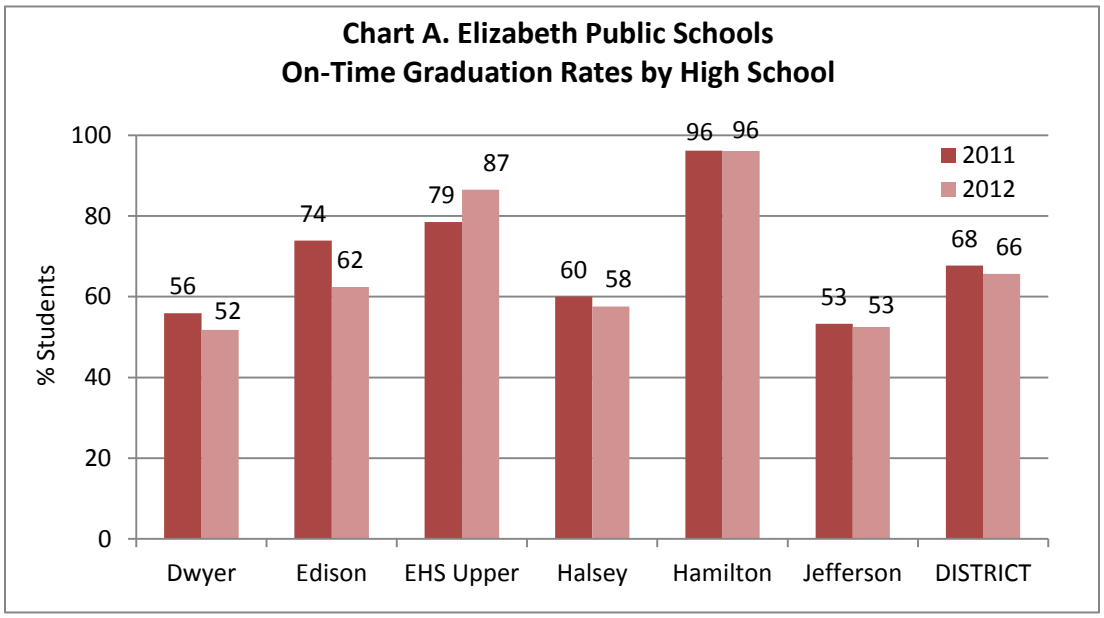
Introduction

The Elizabeth Public Schools (EPS) is the fourth largest district in New Jersey, serving a population of over 25,000 students. While EPS faces the challenges often associated with urban school districts, its student growth has outpaced many other districts, both suburban and urban. Nonetheless, high school graduation rates continue to lag; one out of every three incoming 9th graders does not graduate on-time. In fact, some high schools have graduation rates hovering at 50 percent. While anecdotal evidence pointed to a number of reasons explaining these student outcomes, ranging from failure to pass exit exams to out-of-school behaviors, no comprehensive analysis of the student pathway through high school had been conducted prior to this project. Furthermore, post-secondary enrollment data was limited to high school exit surveys of post-graduation plans. To this end, completing the Strategic Data Project (SDP) college-going diagnostic in EPS had two purposes: (1) to better inform district leaders about college enrollment and persistence rates; and (2) to identify potential areas for action to increase students' levels of academic achievement, preparedness for college, and postsecondary attainment. As an SDP Data Fellow, my role was to gather relevant data to complete the analysis and inform agency leadership of results.

About Elizabeth Public Schools

EPS has been classified by the New Jersey Department of Education as one of the state's Abbott districts, or most needy school districts, in terms of a series of population and income demographics. The district has added 13 new schools within the last 10 years, which has helped alleviate overcrowding while improving instruction and achievement. Enrollment, however, is still growing annually at a rate of about 1,000 new students per year. Today, the district is comprised of 3 Early Childhood Centers, 25 K-8 schools, and 6 High Schools. Approximately 69% of students are classified as Hispanic; 21% Black; 8% White; and 2% Asian. More than 40 languages are spoken by the student body with the largest percentages of students speaking Spanish, English, Haitian Creole, and Portuguese.

Prior to 2009, Elizabeth High was the largest high school in the nation, serving over 5,000 students. In SY2009-10, the high school was split into 6 different academies, each operating as an independent high school, including one that has retained the Elizabeth High School name. In May 2011, Elizabeth High School was nationally recognized by *The Washington Post* as the second most challenging high school in New Jersey. Nationwide, it was ranked in the top ten percent of high schools. Despite these accomplishments, on-time graduation rates in the district remain persistently low (see Chart A and Appendix A).



Project Vision and Communication

In EPS, there was a desire to identify why graduation rates were low at four of the six high schools, especially given the Department of Education's designation as "Focus" school status. Focus schools have a graduation rate below 75% and receive targeted and tailored solutions to meet the school's unique needs. Prior to beginning work on the SDP Toolkit, I had provided senior leadership with smaller analyses related to student performance on a number of college and career readiness indicators, including AP achievement and success, relationship between Algebra I success and high school graduation, and college enrollment patterns. Each set of analyses sparked dialogue and additional questions regarding student success and risk factors. Recognizing the lack of data knowledge regarding students' pathway through high school and graduation allowed me, as a data strategist, to capitalize on this opportunity to conduct the in-depth analysis needed to answer these pressing questions, using the SDP College-Going Success Toolkit for Effective Data Use (referred to as the SDP Toolkit).

Project Implementation

Project implementation followed the steps in the SDP Toolkit for Effective Data Use in education agencies, in addition to a planning component. The process is outlined below.

1. **Data Access and Planning Phase**

   Before diving into the SDP Toolkit, it is important to familiarize yourself with the materials and steps required to complete the analysis in a timely and accurate manner. This will allow you to set realistic goals and timelines. Second, engaging relevant departments and colleagues is critical to the project's success. At EPS, this meant collaborating with programmers in the IT department, who provided access to the data servers and data warehouse. Reviewing the project goals and providing data templates to the IT programmers in advance allowed for clear communication and data specifications, which facilitated the data cleaning process later on. If you have access to the database and are able to program and extract data yourself, this should make the process easier. Otherwise, it is critical to maintain clear and open channels of communication with the data gatekeepers to ensure the project's success. Finally, ensure that adequate time is set aside to work with the data. Given that EPS is a relatively small district and lacks capacity in terms of data analysis, I was the only person working on the SDP Toolkit. Having to complete analyses for competing priorities and new district initiatives related to teacher evaluation impacted the original timeline. Thus, it is critical to dedicate time and resources from the onset.

2. **Identify Your Data**

   The 5 W's of Data Collection

   The 5 W's of Data Collection provided in the SDP Toolkit is a helpful resource for identifying the data points and communicating with various stakeholders. Answering these questions as they relate to your agency will lay the foundation for subsequent analysis. What are the research questions? What data will you need to answer them? Where is the data stored and how accessible is it? Who owns the data systems? What time frame will you incorporate in your analysis? At EPS, I chose to focus on the two most recent cohorts of graduates due to recent changes in the student information system which made it more challenging to access historical data.

   Data Specification Guide

   The SDP Toolkit also provides a data specification guide with comprehensive tables that suggest which data elements are absolutely critical for the analysis and which would be good to have but not essential. This guide facilitated my conversations with EPS programmers by providing a template of variables needed and how the data should be coded. It also streamlined the process and lessened the burden on one of our busiest divisions. Once the Identify stage is complete, you will have a better sense of how complete your agency data is and what may be missing.

3. Clean: Data Building Tasks

This is the most time consuming step in the SDP Toolkit process and analysts should anticipate and budget time accordingly. The Clean stage consists of seven tasks that allow analysts to clean the raw data files, such as identifying duplicates and reconciling inaccuracies using decision rules. Some data challenges analysts may face include wrong or missing data, agency changes that may have impacted how student data is stored, student mobility, course descriptions not standardized in the database, discrepancies with credits earned, and constructing the cid datapoint. During the cleaning process analysts may uncover additional discrepancies that may require going back to the raw data files to identify accurate or even new data elements. Some discrepancies may be due to an error in the programming code and others may be due to a data entry error. In case of a programming error, this can be resolved with consistent communication with the IT programmers to resolve. For data entry errors, it may take more time to follow-up with relevant colleagues in order to verify any inconsistencies.

4. Connect: Data Building Tools

Once the separate data files have been cleaned from the previous step, they can be merged into one large analysis file. The SDP Toolkit provides Stata code for analysts less familiar with coding and merging using the statistical software. The SDP Toolkit also includes an overview of the output generated by each step, which is useful to confirm that the merge is accurate. In addition, you will generate agency specific on-track variables that will allow you to analyze on-track to graduation status. Every agency has its own definition of on-track status at the end of each high school year. At EPS, 160 credits are needed to graduate from high school, including 20 in ELA and 20 in Math. Promotion from grade to grade is based on credits earned, therefore on-track status is defined as:

- On-track by end of 9th: 40 total credits, 5 ELA, 5 Math
- On-track by end of 10th: 80 total credits, 10 ELA, 10 Math
- On-track by end of 11th: 120 total credits, 15 ELA, 15 Math

5. Analyze: College-Going Success

An important first step in this phase is identifying which analyses are most relevant to your agency. The SDP Toolkit includes a comprehensive map of analyses and code in Stata, as well as the Strategic Performance Indicators developed from SDP research using partner agency data. Not all analyses may apply, and some may need to be modified. For example, in EPS, because 8% of the student body is white, I examined the Black-Latino achievement gap rather than the Black-White gap. For each analysis, ask yourself what questions make most sense for your agency, how can you modify existing analysis and code, and how can you dig deeper. One strategy to help shape this phase of the analyses is to share preliminary results with senior leadership for

feedback. A EPS, as one of the first set of findings I shared was the on-track status at the end of 9th grade. Since retention is an critical piece of how we examine student achievement, it became a part of the conversation related to on-track status. More than one third of incoming 9th graders are overage for their grade; thus, we examined student outcomes according to retention status. Sharing preliminary findings with district leaders will further contribute to the analyses and help answer questions that are critical for your agency.

Outcomes

Our findings indicate that over 50% of students who are off-track to graduate at the end of 9th grade eventually drop out. This, along with other preliminary findings, has been shared with district leadership, which prompted additional questions as to which courses were driving these numbers. We discovered that a large number of students were failing P.E. for not having the proper uniform. Due to this finding, immediate changes were made to the district grading policy so students will no longer be unfairly penalized. Additionally, we found that Environmental Science had a high failure rate among 9th graders due to a quarterly benchmark assessment. This prompted additional review of the curriculum and changes to this particular benchmark assessment. By implementing these changes, we expect to see positive impacts the on-track indicator in the near future. Additional analysis highlighting the rates of college enrollment of highly qualified students also had an impact among district leadership. Over a quarter of highly qualifies students are not enrolling in college or attending less selective colleges despite having the qualifications to attend more selective institutions. We are in the process of engaging high school guidance counselors to gather feedback and improve these rates, as well as examining the summer melt research taking place across the country. See Appendix B-D for a snapshot of findings.

Lessons Learned

Analysts who are interested in replicating the analysis included in the SDP Toolkit for Effective Data Use should make the project a priority by setting aside sufficient time to engage with large amounts of data. The analysis requires time and mentality that can easily be pushed aside when other pressing needs arise. If possible, a second analyst or thought partner would move the project along. Second, sharing initial cuts of the data will generate more questions and strategic analysis, and lead to excitement in the larger analytical findings. These initial findings may lead to immediate changes in district policy, as was the case in EPS with the change in grading policy and staffing. The standard set of analyses provided in the SDP Toolkit is merely a starting point for data strategists. It is critical to engage with senior leadership in order to generate findings that are most relevant given the agency's student population and priorities.

APPENDIX A. STUDENT CHARACTERISTICS

Table 1A summarizes the demographic characteristics of high school graduates in EPS from the 2007-08 and 2008-09 cohorts. The percentage of students who were overage upon entering ninth grade for the first time was relatively high. Nearly 1 in 4 students was new to the district (no prior record in the district). Table 1B summarizes the percentage of students in each cohort manifesting early warning indicators in ninth grade, which research indicates are predictors of graduation outcomes. The percentages are based only on those students with data available in ninth grade.

Table 1. Characteristics of EPS Ninth Graders

A. Demographic Characteristics	2007-08 Cohort (N= 1,059)	2008-09 Cohort (N= 1,344)	Both Cohorts (N= 2,403)
Female	51.5%	48.3%	49.7%
Free or Reduced Lunch	88.2%	91.0%	89.8%
Special Education	12.9%	14.4%	13.7%
Limited English Proficient	13.0%	40.2%	28.2%
African-American	25.8%	24.3%	24.9%
New to District	23.7%	24.6%	24.2%
Overage for Grade	32.3%	36.2%	34.5%
B. EWI Indicators in 9th Grade	2007-08 Cohort (N= 1,059)	2008-09 Cohort (N= 1,344)	Both Cohorts (N= 2,403)
Chronically Absent (>20)	12.0%	16.7%	14.5%
Failed One or More Courses	36.8%	42.9%	40.1%
Failed Two or More Courses	20.2%	29.5%	25.2%

APPENDIX B. ANALYSES: PROGRESS TOWARD GRADUATION

1. What percentage of students in EPS graduate from high school in four years?

Figure 1. Ninth-Grade Cohort Graduation Rate
2007-08 and 2008-09 Cohorts
(N=2,403)

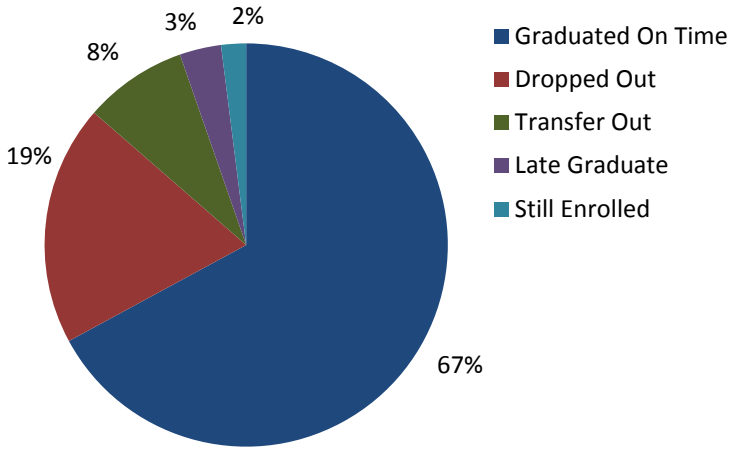
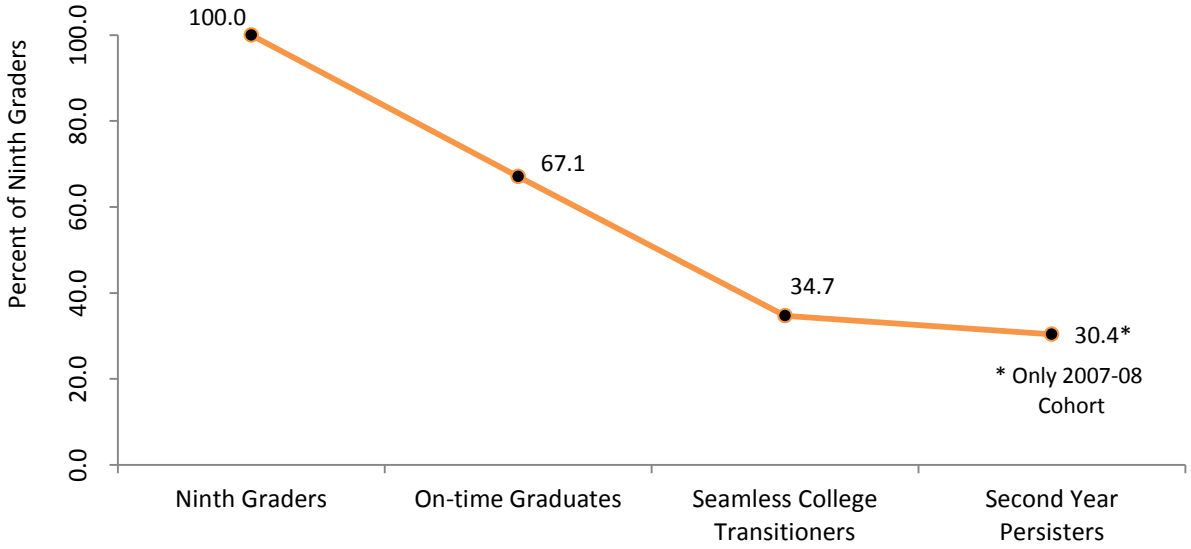


Figure 1 presents the status of first-time ninth graders in 2007–08 and 2008-09 after four years of high school. Sixty-seven percent graduated within four years. Nearly 20% were confirmed dropouts or left the district without providing evidence of transferring to other schools. Although some of the students who disappeared may have enrolled in another high school, we count all students who left without evidence of transfer as having dropped out.

2. How do first-time ninth graders in EPS progress through high school and college?

Figure 2. Student Progression from 9th Grade Through College
Elizabeth Public Schools Average



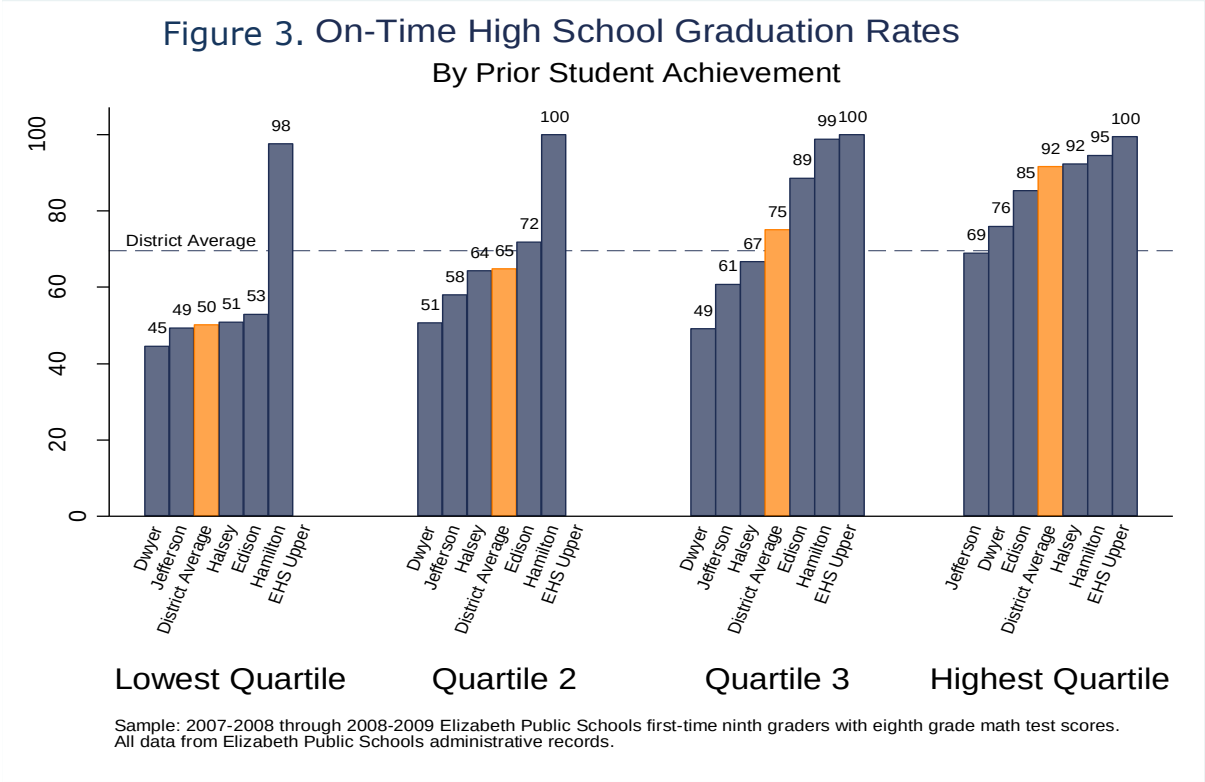
Sample: 2007-08 and 2008-09 first-time ninth graders. Postsecondary enrollment outcome from NSC matched records. All other data from Elizabeth Public Schools administrative records.

For every 100 first-time ninth graders enrolled in Elizabeth Public Schools in 2007–08 and 2008–09, 67 graduated high school and 35 seamlessly transitioned to college. We are only able to observe persistence in college for the 2007-08 cohort. For this cohort, 30 persisted to the second year of their postsecondary studies. By comparison, for every 100 ninth graders nationwide, roughly 78 graduate high school within four years and 68 immediately enroll in college.

3. How do graduation rates vary across schools with groups of students with similar prior achievement?

Figure 3 separates all students in the district into quartiles based on prior achievement in eighth grade Math and shows the graduation rates of students by school in these prior achievement groupings. This analysis is useful to explore high school completion rates across schools with students in the same quartile or range of achievement. Each high school is repeated as a blue bar in each quartile.

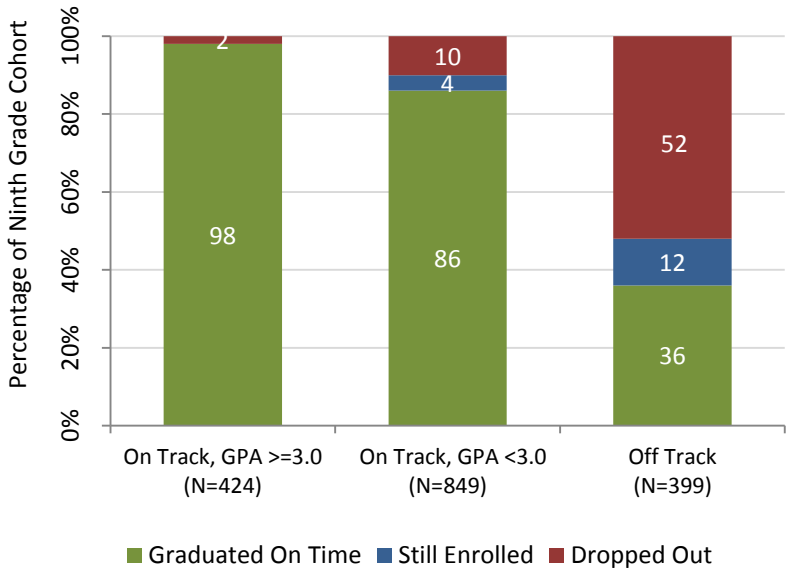
Across the district, graduation rates were higher on average for students with higher incoming eighth grade math scores. Students who begin high school in the top quartile of math scores graduate from high school at nearly the same rate at all but two EPS high schools, Jefferson and Dwyer. The most variation among school was in the third quartile of prior achievement. For these students, depending on which high school they attend, they have very different graduation rates. For example, the graduation rate at Dwyer is 49% compared to 89% at Edison for students in the same quartile.



APPENDIX C: ON TRACK FOR GRADUATION AND OFF-TRACK RECOVERY

4. How do ninth-grade credit accumulation and grade point average (GPA) relate to four-year graduation outcomes?

Figure 4. Enrollment Outcome in Year 4
By On-Track Status at the End of Ninth Grade

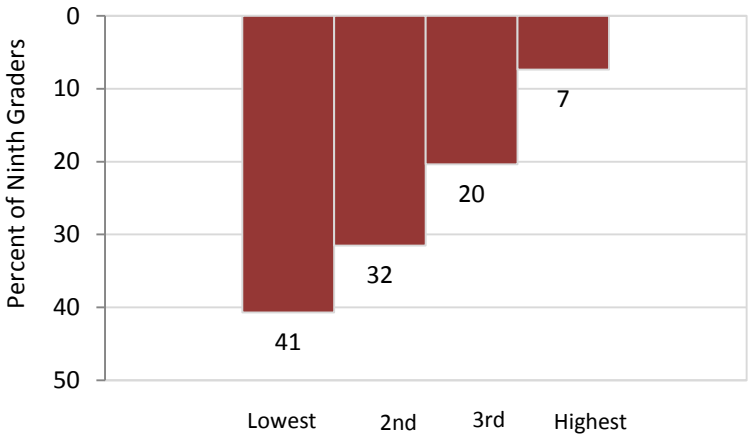


Performance in ninth grade is strongly related to graduating on time in EPS. Figure 4 presents the status of students at the end of their fourth year in high school disaggregated by their end of ninth grade on-track status. Among students on-track to graduate at the end of ninth grade, those who had at least a 3.0 cumulative GPA were more likely to graduate than those who were on-track, but had a lower GPA.

Those who fall off-track during their first year of high school were far less likely to graduate than their peers. Yet, many of these students do not ultimately leave school. Thirty-six percent of off-track students recovered enough credits to graduate within four years. Thus, recovery is possible, even for students far behind at the end of their first year.

5. What is the relationship between achievement prior to high school and being off track by the end of ninth grade?

Figure 5. Students Off-Track to Graduate by End of Ninth Grade
By Quartile of Prior Achievement

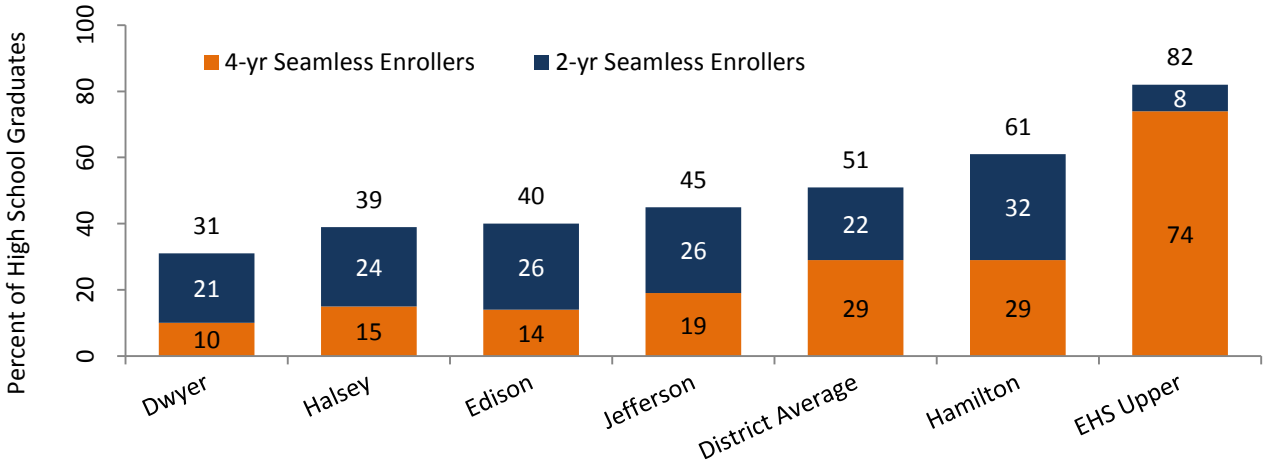


41% of students in the bottom quartile of eighth grade achievement are off-track to graduate at the end of ninth grade, compared to only 7% of those in the top quartile. Clearly eighth grade achievement is a strong indicator of being off track to graduate at the end of ninth grade.

APPENDIX D: COLLEGE ENROLLMENT

6. What are college enrollment rates for EPS graduates?

Figure 6. College Enrollment by High School
Seamless Enrollers



Sample: Class of 2011 and 2012 graduates. Postsecondary enrollment outcomes from NSC matched records. All other data from administrative records.

7. At what rates do high-performing high school graduates from EPS attend college?

Figure 7. Rates of Highly Qualified Students Attending College, By Race
Among Graduates Eligibile to Attend Four-Year Universities