Center for Education Policy Research
HARVARD UNIVERSITY

STRATEGIC DATA PROJECT

SDP FELLOWSHIP
CAPSTONE REPORT 2016

Targeting College Readiness from Pre-K to High School

Abraham Ahn, Elizabeth Public Schools
Russell Clement, Broward County Public Schools
Corradina Fronte, Paterson Public Schools
Danny McClain, IDEA Public Schools

Executive Summary

In an effort to ensure high school graduates possess college-ready skills, as well as enroll and persist in college, SDP Fellows in Elizabeth Public Schools, Broward County Public Schools, Paterson Public Schools, and IDEA Public Schools wanted to know: What factors best predict college success? How early can indicators predict college success?

The SDP Fellow in Elizabeth Public Schools identified key performance indicators and developed benchmarks to continuously monitor student progress toward on-time graduation and postsecondary enrollment. The SDP Fellow found that 98% of ninth graders who advanced to 10th grade with a 3.0 GPA graduated from high school on-time, yet students qualified to attend a four-year institution were not necessarily applying, and students qualified to attend higher-ranking institutions were not pursuing a higher quality college match.

Using the correlation between PSAT and elementary and middle school state test scores, the SDP Fellow in Broward County Public Schools identified the value-added school effects of middle schools for college readiness. In Broward County, performance of students prior to entering middle school is strongly related to their future PSAT performance. The SDP Fellow was able to identify schools that have the greatest impact on student achievement.

The SDP Fellow in Paterson Public Schools leveraged the potential of longitudinal data collection, beginning in preschool, for predicting at-risk status. In Paterson, students receiving free lunch disproportionately were assigned at-risk status in literacy based on an assessment of kindergarten readiness. Additionally, students who did not attend Paterson preschool had higher growth rates than students who attended.

Finally, the SDP Fellow at IDEA Public Schools correlated indicators with student consecutive persistence in college for three or more years. For IDEA students, predictors of three-year college persistence include average daily attendance, passing AP exams, high school GPA, core course grades and passing or scoring advanced on state assessments.

Strategic Data Project Fellowship Capstone Reports

Strategic Data Project (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 the Center for Education Policy Research at Harvard University.*

Introduction

What is the purpose of public education in the United States? This question elicits a broad range of responses that, at first glance, seem to have little consensus. When 300 individuals were asked to specify in 30 or fewer words what they believed to be the purpose of education, they generated responses that could be classified into 19 categories ranging from "teach the skills for passionate advocacy" to "teach students what it takes to achieve their professional goals" (Wolper-Gawron, 2011). Even public education administrators have divergent views on its purpose. In a 2009 survey of 900 school board members, 43% said the most important goal of education was to "help students fulfill their potential"; only 8% said "prepare students for college" and another 8% said "prepare students for the workforce" (Hess & Meeks, 2010). However, a deeper examination revealed that responses tended to be future-oriented with the goal to create or develop individuals who bring some value to society. Thus, one might argue that preparing students to reach their full potential subsumes the goals of preparing students to attend college, earn a college degree, and become gainfully employed in a field related to the degree. In other words, it is reasonable to argue that a primary purpose of public K–12 education is to prepare students to be successful in college and subsequently the workplace.

The benefits of a college education, especially the economic benefits, have been extensively documented. For instance, compared to individuals without a degree, college degree holders earn higher incomes, and this difference has been increasing. On average in 1956, high school graduates earned 81% of the salary earned by college graduates. By 2013, high school graduate income was reduced to 62% of what college graduates earned (Pew Research Center, 2014). The realized economic benefits, however, vary across individuals, institutions, and fields based on a complex cost–benefit calculus (Oreopoulos & Petronijevic, 2013). And, students who do not complete a four-year degree do benefit from completion of a two-year degree (Oreopoulos & Petronijevic, 2013). The benefits of a college education extend beyond income to include improvements on other socioeconomic outcomes like decreased poverty, physical health including a longer life expectancy, mental health such as more happiness, occupational prestige, decreased incarceration, and family relationships including a higher marriage rate (Trostel, 2015). Given the broad range of benefits, ensuring that the maximum number of students successfully enters college is imperative.

College Attendance and Preparation

Approximately two-thirds of America's public school graduates enter college upon high school graduation. The enrollment rate for students entering college in the fall immediately following high school graduation increased by 8% between 1990 and 2016, from 60% to 68% (National Center for Education Statistics, 2016). However, once students enter college, there is no guarantee they will complete a degree. Just over half (56%) of students who entered college in the fall of 2007 earned a degree within six years. And an additional year does not increase college completion substantially: 58% of students who entered college in the fall of 2006 had completed a degree seven years later (Shapiro, Dundar, Ziskin, Yuan, & Harrell, 2013). Low college entrance and completion rates have led to an examination of the preparation students are receiving.

College preparation has been viewed as primarily the domain of high schools. A decade ago, the Secretary of Education's Commission on the Future of Higher Education report was critical of high school preparation, noting that 12th grade was in many ways a lost year, that there were few standards in place specifically for 11th and 12th grades, and that obtainment of a diploma does not necessarily indicate mastery of skills that will ensure success in college and the workplace. Recommendations in the report focused on high school standards and curricula, with a more implicit need for reform at the lower grade levels (U.S. Department of Education, 2006). In recent years, the Common Core Standards were established to provide clear, consistent guidelines for what every child should know in math and literacy from kindergarten through Grade 12. These standards focus on the critical thinking, problem solving, and analytical skills that students need for success after high school. Presently, 42 states have voluntarily adopted these standards.

There is increasing evidence that high quality curricula and instruction, data driven improvement, and instructional leadership create a learning environment conducive to success and a solid foundation for lifelong learning. With this in mind, a comprehensive approach is needed in preschool through third grade to ensure that students develop a solid foundation in literacy, math, and social-emotional skills. Recent data from the National Assessment of Educational Progress (NAEP) reading assessment (U.S. Department of Education, 2009) show that a third of our nation’s 4th-grade students are performing below basic levels in reading. Others have noted that even more low-income children (49%) fall below basic (Hernandez, 2011). This means that students are unable to locate information, understand the meaning of words, and make simple inferences from a text. Without these essential skills, students are six times more likely to drop out of school. If they do graduate and go on to college, they are likely to need academic remediation once they arrive.

The National Center for Education Statistics (NCES) defines remedial courses “as courses in reading, writing, or mathematics for college-level students lacking those skills necessary to perform college-level work at the level required by the institution” (Parsad &

Lewis, 2000, p iii). Using self-report data from the National Postsecondary Student Aid Study, Sparks and Malkus (2013) reported that remedial course taking decreased from 26% of students in 1999–2000 to 19% in 2003–2004, and rebounded slightly to 20% in 2007–2008. However, these data come with a number of precautions due to self-reporting, low response rates, and potential underrepresentation of the full extent of need.

Available evidence suggests that substantial numbers of U.S. high school graduates either do not go to college or, if they do go, do not complete degrees and need remediation upon entry. These indicators suggest that K–12 public education needs to do a better job at preparing students for the rigors of college. With this in mind, the current capstone project details work in four school districts: Elizabeth Public Schools in New Jersey, Broward County Public Schools in Florida, Paterson Public Schools in New Jersey, and IDEA Public Schools in Texas. All four districts are engaged in improving college readiness preparation for all students across the grade span.

Case Study 1:
Elizabeth Public Schools

Elizabeth Public Schools (EPS) is the fourth largest school district in New Jersey. It serves 26,000 students in 35 pre-K to Grade 12 schools and continues to grow. The district currently includes three early childhood centers, 26 pre-K to Grade 8 schools, and six theme-based high school academies. Most of the students in the district (86.7%) come from families at or below the poverty level. These students are racially and ethnically diverse: More than two-thirds (69%) are Hispanic or Latino, 21% are African American, 8% are White, and 2% are Asian or Pacific Islander. Sixteen percent of the students are English language learners, and 9% qualify for special education.

EPS has an accountability system for schools and other administrative and functional units that holds people responsible for meeting standards and delivering excellent results. The system identifies key performance indicators, measures performance using these indicators, collects and distributes performance data, and applies predetermined consequences (rankings, rewards, sanctions, and/or interventions) for achieving predefined outcomes. The Research and Evaluation Division provides performance and assessment results and facilitates data use and analysis among central office divisions and school leaders. This serves as a platform for school-wide collaboration and discussion about instructional strategies that impact student learning.

Policy/Research Issue: The New Role of Data Analytics

The Elizabeth school district is making strides to transform its data strategy from quick and descriptive statistics to analytics that explore key questions and actionable opportunities. With stronger systems and processes to better use data to make informed policy and management decisions, EPS is increasing its analytical capacity to drive continuous improvement. To this end, during the 2014–2015 school year, EPS transitioned to Schoolnet, an Instructional Management System (IMS) that enables the district to improve student achievement and drive efficiency by bringing together all of the programs and initiatives around assessments, curriculum, instruction, and reporting and analysis into a single user-friendly platform. The district conducted an in-depth analysis of formative and summative assessments, including district created benchmark assessments, using Schoolnet as the main data platform. EPS hopes a predictive analysis investigating the relationship between benchmark assessments and student achievement will shed light on the effectiveness of the curriculum and allow informed instructional decisions based on a rigorous analysis of these assessments.

Another focus issue for the Strategic Data Project (SDP) Fellow is around college readiness. Two key goals for the district are to define what college readiness means in EPS and to develop benchmarks and key performance indicators to continuously monitor student progress towards on-time graduation. Potential deliverables include early warning indicator reports and/or systems, and identification of indicators that are predictive of graduation and postsecondary enrollment.

In partnership with SDP, the district was able to evaluate its internal assessments, providing critical feedback about increasing validity and reliability in order to strengthen curriculum and instructional practice to improve student achievement. For the college readiness work, the district tried to identify early warning indicators of graduation and postsecondary enrollment and implement systems and processes to monitor them on a regular basis. Therefore, the SDP Fellow—who has quantitative and analytical expertise and who understands the context of the classroom and school systems—provides critical leadership in examining current practices, as well as clear feedback on the use of data to impact decisions across the organization. Also, the SDP Fellow analyzes internal and external student assessment data, provides critical feedback to strengthen the use of assessment data in EPS, evaluates current systems and approaches to using data in EPS, and identifies ways to streamline data collection and use in planning.

Framing the Problem

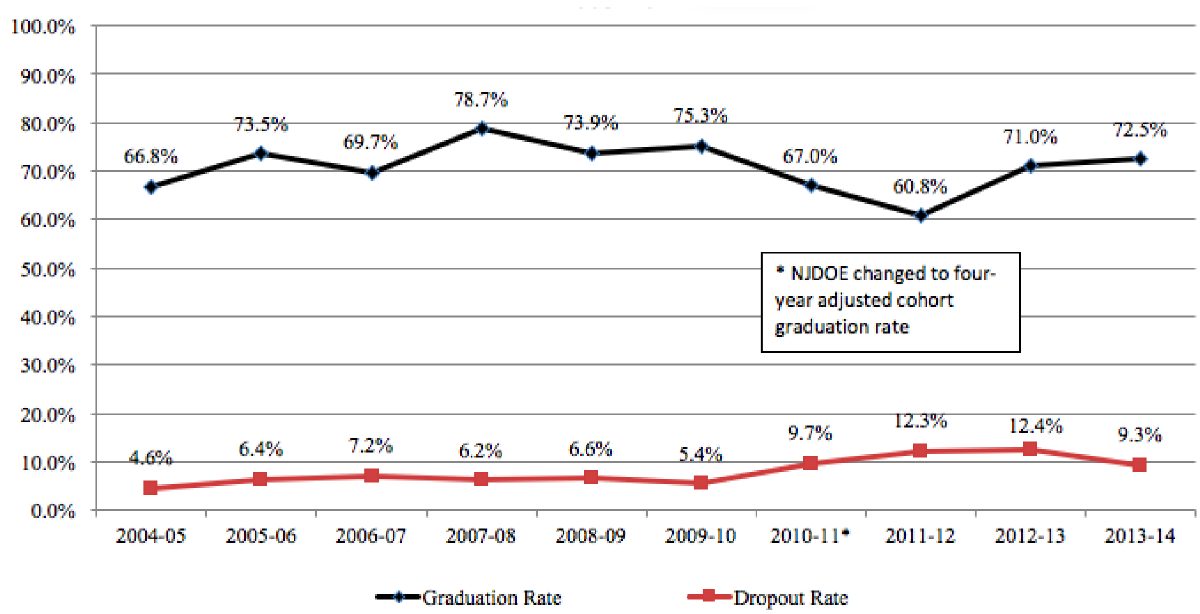

Figure 1. Historical graduation and drop-out rates for Elizabeth Public Schools 2005-2014

High school graduation is a continuing challenge in EPS. About two-thirds of incoming ninth graders graduate within four years (see Figure 1). In some schools, the on-time graduation rate is as low as 52%. There is an urgent need for the district to better understand current performance and uncover issues related to on-time graduation and college readiness. Yet the district has faced a number of challenges. Historically it has not collected accurate college enrollment data, so it was unable to track student trajectories through high school and into college. Instead, the district collected high school exit surveys to track college enrollment. The district also did not collect information about what schools were doing to prepare students for college and careers. While anecdotal evidence pointed to a number of reasons students in Elizabeth might not be finishing high school—such as failure to pass exit exams or a record of problematic out-of-school behavior—prior to this project, no comprehensive analysis of student pathways through high school had been conducted. For this reason, the district enabled its SDP

Fellow to dig deeper into the data and uncover useful information for its educators and administrators to better understand the high school pathway and college enrollment.

The current project used the two most recent cohorts of graduates because four years ago the district transitioned to a new student information system, and much of the historical data resides in the old server. Much of the data had never been requested in this format so the data specification guide was a good resource. Because the district has a relationship with NSC, the SDP Fellow began that process early on in order to have college enrollment data to include in the toolkit. To achieve the goal of identifying actionable opportunities to improve student outcomes, the team sought to answer the unknown and confirm hunches. In particular, they sought insights on the current district graduation rate, students' transitions from ninth- to 10th-grade, and the college enrollment rate of district alumni. Throughout the process, the team shared smaller analyses with relevant stakeholders.

Results from the Early Warning Indicator Project

The project took one year due to the reality of district life and various competing priorities; however, EPS was able to provide early analyses to the district that would prove useful and lead to some immediate action.

Graduation status. Figure 2 presents the graduation status of students at the end of their fourth year in high school, disaggregated by their on-track status and GPA at the end of Grade 9. It shows that performance in ninth grade was strongly related to graduating on time: Nearly all students (98%) who were on track and had a GPA of at least 3.0 in the ninth grade went on to graduate in four years. Fewer students (86%) who were on track but had lower GPAs graduated on time—a difference of 12 percentage points. Those who fell off track during their first year of high school were far less likely to graduate than their peers. Nevertheless, 36% recovered enough credits to graduate within four years. Thus, recovery is possible, even for students who are far behind at the end of their first year.

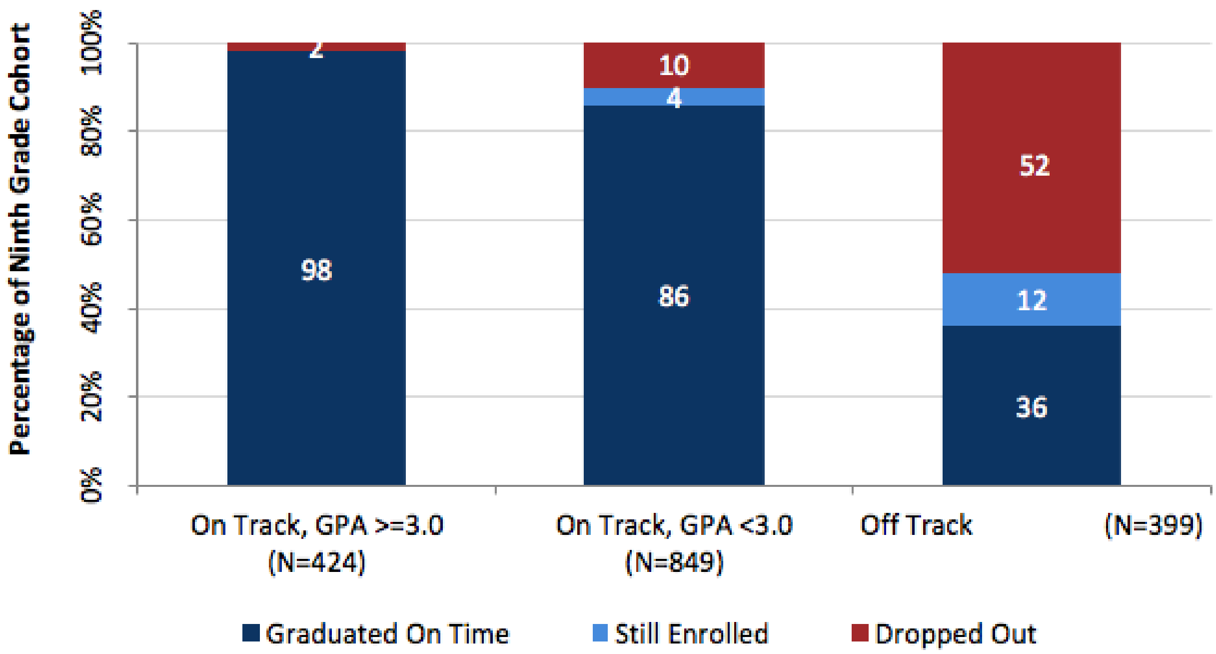

Figure 2. EPS student outcomes after four years in high school by on-track status and GPA in Grade 9.

Absences and dropout. District policy dictates automatic credit withheld for absences greater than nine days. In Figure 3, students are dividing into three tiers needing different interventions. Those in the classroom and not earning credits need academic support, as opposed to students who are chronically absent and do not have the opportunity to learn the content. The district continues to focus its efforts on targeting groups of students most likely to benefit from intervention.

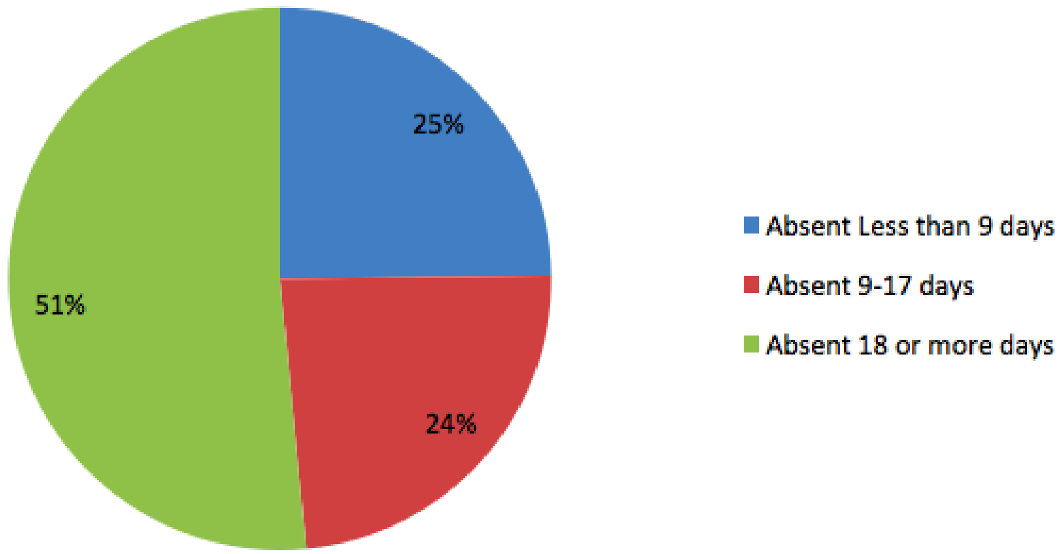

Figure 3. EPS absences by off-track status at the end of Grade 9.

Also, there was a large spike in dropouts by the end of the fourth year due to the number of students who transferred to alternative adult education programs (Figure 4). These students were unverified by the Department of Education and were therefore classified as dropouts since there is no evidence of enrollment or completion of a high school diploma.

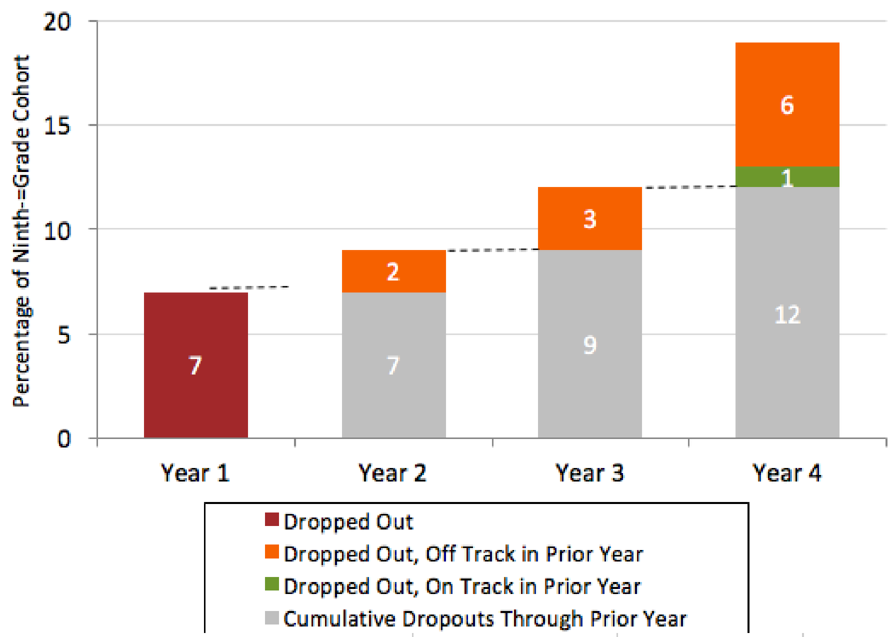

Figure 4. EPS dropout rates by year and on-track to graduate status

Ninth-grade college-going. District stakeholders were only able to observe persistence in college for the 2007–2008 cohort. For this cohort, 30% persisted to the second year of their postsecondary studies. By comparison, for every 100 ninth graders nationwide, roughly 70 graduate high school within four years, 40 immediately enroll in college, and 30 persist to their second year. See Figure 5.

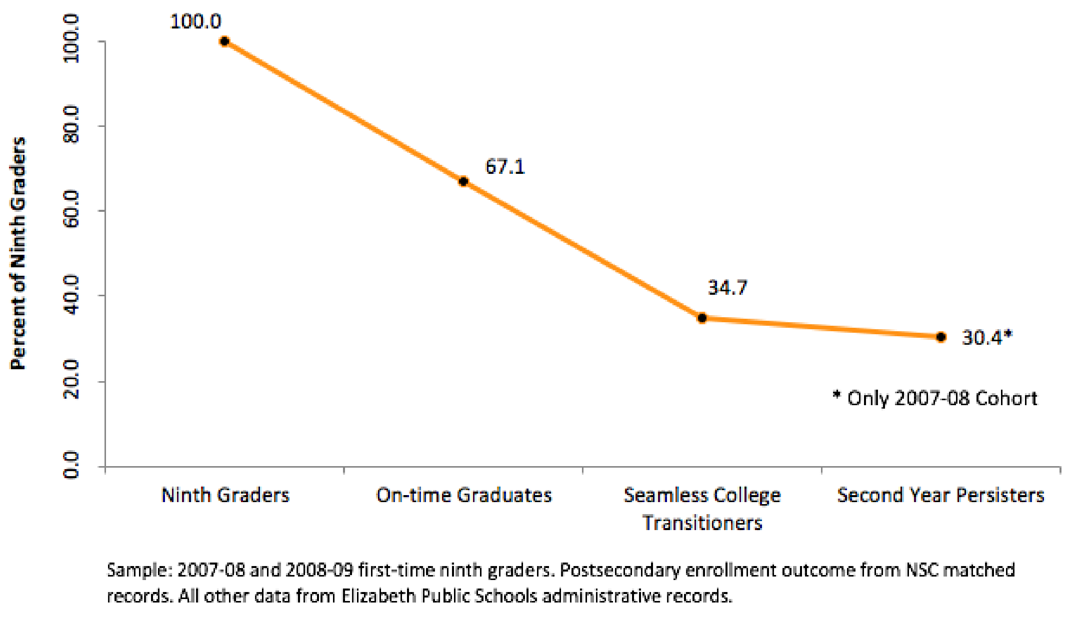

Figure 5. EPS average student progression from ninth grade through college

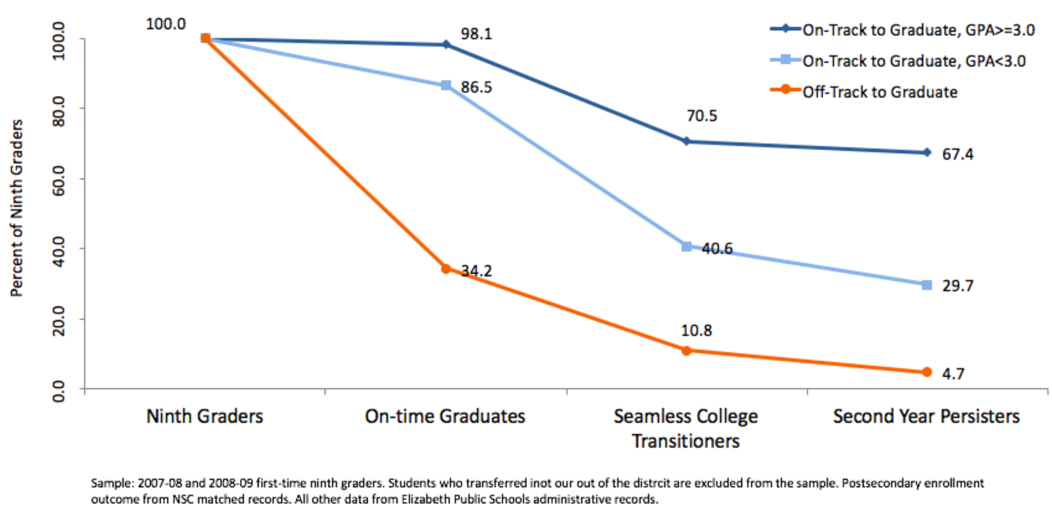

Figure 6. EPS student progression from ninth grade through college by on-track status

Analysis of Benchmark Assessment Data

EPS is committed to using ongoing and periodic benchmark data because they have the potential to play a key role in school, team, or grade-level improvement. Most can be scored and reported quickly, making results available for real-time use. They are also more flexible than external assessments, so they can provide additional opportunities for planning grade-level improvement, monitoring progress, conducting staff development, and re-teaching. When used in this way, benchmark and common assessment data may be the basis for building a team-based professional learning community in a school.

Most importantly, benchmark and common assessments provide teachers regular and timely feedback, well before the high-stakes external assessment and from a knowledgeable source outside the classroom or school, on the strengths and weaknesses of students in relation to the most important curriculum indicators, objectives, and assessment limits. Data expert Douglas Reeves referred to benchmark and common assessments as “the best practice in assessment” and “the gold standard in educational accountability.” Benchmark assessments often result in a great deal of student information, requiring teacher teams to have adequate time to analyze the data and plan appropriate instructional adjustments.

Results and Next Steps

Based on the analyses described above, EPS found that, overall, more EPS students qualify to attend four-year institutions than apply, and more EPS students qualify to attend higher-ranking institutions. Moreover, the analyses revealed that EPS needs to better understand the relationship between GPA/SAT and college applications. And finally, it is clear that Grade 9 is of critical importance; students who are not on track for on-time graduation at this point are very likely to drop out, and are therefore not likely not attend college.

As a result of these analyses, EPS has made the decision to augment the curriculum to encourage student participation. The district has changed grading policies to support students and increase opportunities to succeed, and made human resource adjustments, such as moving the best teachers to ninth grade. The district response also includes developing new programs to support at-risk students such as Naviance, Check & Connect, and APEX Credit Recovery Program.

The district will continue to build its data capacity, develop standard on-track reports to share on a regular basis, embark on “data dives” with school leaders, implement an IIS, and train teachers on reading real-time data reports. EPS has made great strides in addressing its on-time graduation crisis in less than three years by using data. No longer focused on simply “proficiency” and “non-proficiency,” educators are looking at data more critically and expanding the scope of what is possible, especially using data to increase students’ on-track and graduation rates.

Case Study 2:

Broward County Public Schools

Located in southeast Florida, Broward County Public Schools (BCPS) is the nation’s sixth largest school district. Fully accredited since 1962, BCPS presently serves more than 268,000 students in 238 district-operated schools and 103 charter schools. As specified in the BCPS strategic plan, the district’s vision is “educating today’s student to succeed in tomorrow’s world.” The BCPS mission is to “[educate] all students to reach their highest potential.” The vision and mission are support by three goals: to provide “high-quality instruction, continuous improvement, and effective communication.”

BCPS serves a highly diverse population. It provides education services to 31 municipalities, covering both urban and suburban regions, each with unique characteristics and needs. At the district level, 51% of students are White, 41% are Black, 4% are Asian, 3% are multiracial, 1% are Native American, and fewer than 1% are Pacific Islander. BCPS is also culturally diverse, with nearly one-third of students (32%) identifying as ethnically Hispanic. In fact, more than 180 different languages are spoken by BCPS students and families. Nearly two-thirds of the students (64%) are eligible for free or reduced-price lunch, 12% have disabilities, and 11% are English language learners. Services are provided to this population with a budget of $3.5 billion (2015–2016). Instruction is delivered by 14,088 teachers, who are supported by 11,405 administrative, clerical, and support staff. More than 6,000 substitute and temporary staff are available to ensure delivery of instruction and district operations in the event of staff absenteeism.

Policy/Research Issue

A BCPS strategic plan objective tied to the goal of high-quality instruction is to ensure that all students graduate college- and career-ready. However, only half or fewer of 2015 BCPS graduates were meeting college readiness benchmarks on the SAT (50% in reading; 49% in math) or the ACT (38% in reading; 30% in math).[1] Anecdotal evidence suggests that college preparation is largely viewed by school staff as the purview of high schools. This view is supported by the fact that the Florida Department of Education establishes grade-level goals for students in terms of performance expectations on state exams. For accountability purposes, students are only required to perform at the "satisfactory" level—Level 3 out of 5 (Florida

[1] College-ready benchmarks were provided by the vendors (ACT Research and Policy, 2013; Wyatt, Kobrin, & Proestler, 2011). Analyses were conducted by BCPS staff.

Department of Education, 2015), which represents minimum grade-level expectations (Florida Department of Education, 2016). This is not sufficient to ensure students are on track for college readiness. In the 2014–2015 assessment, only 31% of BCSP eighth-grade students met the “proficiency” or higher levels in English/language arts (ELA) and 50% did so in mathematics (Woods, 2016). With a mindset at the elementary and middle school levels that the minimum accountability threshold is the goal, a district-wide college readiness culture cannot be realized.

Installation of district-wide expectations that all school levels—elementary, middle, and high—are responsible for preparing students for college is essential for improving student outcomes. However, given the size and diversity of BCPS, there are likely schools and areas within the broader region that are more successful than others at preparing students to be on track for college readiness. The present case demonstrates one method for identifying middle schools (and, by extension, elementary schools) that successfully prepare students for college readiness.

The earliest indicator of college readiness available for students in BCPS is the 10th-grade Preliminary SAT (PSAT).[2] The PSAT is provided to all Florida public school students free of charge. As a result, 86% of BCPS 10th-grade students sat for the assessment during the fall 2015 administration. The College Board provides separate college readiness indicators for evidence-based reading and writing (EBRW) and mathematics. According to College Board indicators, students meeting their criteria have a 75% likelihood of achieving a “C” or better in first-year credit bearing college courses (College Board, 2015).

The present project used the PSAT as a criterion to examine middle schools’ impact on college readiness preparation. This allowed us to rank schools according to their impact on the preparation of students. As a second phase, beyond the scope of the present study, high- and low-

[2] BCPS will begin administering the eighth- and ninth-grade PSAT beginning in 2016–2017.

impact schools can be separated and further examined for factors contributing to their level of success.

Preliminary Analyses

Enrollment patters of 10th-grade students. Figure 7 displays the annual enrollment of BCPS 10th-grade students eligible to take the PSAT between 2003–2004 and 2015–2015. The figure shows the total number of students enrolled in each 10th-grade cohort, not adjusting for students who left to attend a charter school or elsewhere and who returned to BCPS. The proportion of 10th-grade cohort students participating in the fall 2015 PSAT was 85.7% (15,522 of 18,112).[3]

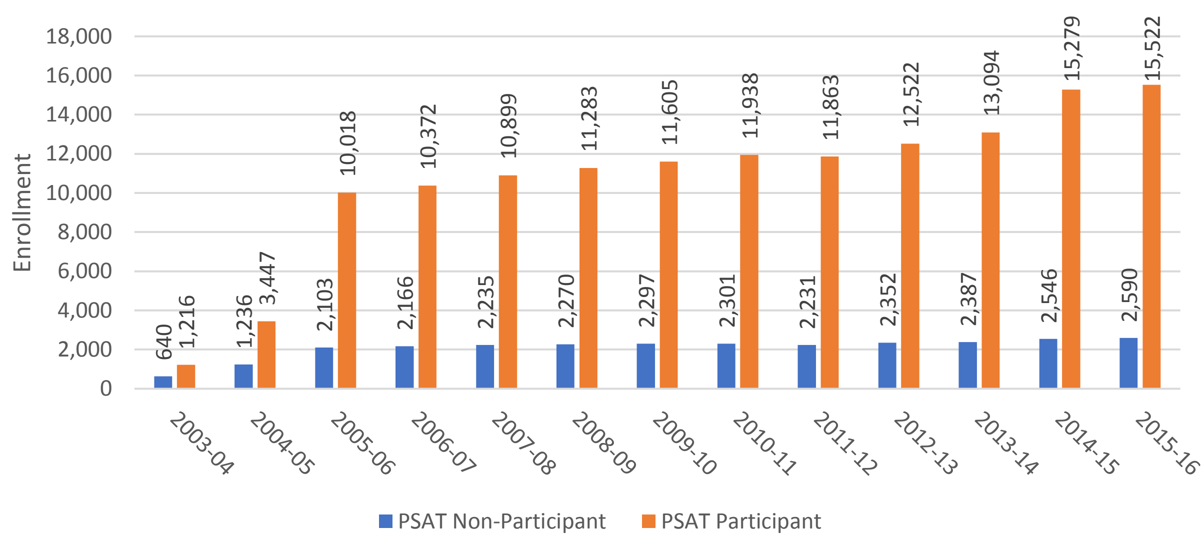

Figure 7. PSAT participation of BCPS Grade 10 cohort, 2003–2004 to 2015–2016.

A total of 8,012 (51.6%) of the 15,522 BCPS students who took the PSAT had been consistently enrolled in a traditional BCPS school since 2006–2007 (i.e., since Grade 1 on a normal trajectory, non-retention track). Relaxing criteria to continuous enrollment from 2008–

[3] Analyses were limited to students attending schools operated by BCPS; charter schools were excluded.

2009, when many of these students were in Grade 3, increased the number to 9,184 (59.2% of the students).

Demographic composition of the cohort. As shown in Table 1, the cohort of PSAT participants represents the student diversity present in BCPS. Looking only at students who were continuously enrolled since Grade 3 (eight-year cohort) and Grade 1 (10-year cohort), we see longitudinal stability in demographic characteristics. Because there is little difference between the eight-year and 10-year cohorts, and the eight-year cohort provides a larger sample, the remaining analyses were restricted to the eight-year cohort.

Table 1

Demographic Characteristics of BCPS Eight- and 10-Year Cohorts

Characteristic	**Total Assessed (N=15,522)**	**8-Year Cohort (N=9,184)**	**10-Year Cohort (N=8,012)**
Gender			
Female	50.1% (7,772)	50.0% (4,591)	50.0% (4,010)
Male	49.9% (7,750)	50.0% (4,593)	50.0% (4,002)
Race			
African American	39.6% (6,139)	37.7% (3,461)	37.2% (2,983)
Asian	3.8% (591)	3.8% (349)	3.7% (300)
Multiracial	3.7% (573)	4.4% (400)	4.4% (351)
Native American	1.7% (260)	2.2% (199)	2.2% (173)
Pacific Islander	<1% (26)	<1% (15)	<1% (12)
White	51.1% (7,933)	51.8% (4,760)	52.3% (4,193)
Ethnic Hispanic	30.2% (4,681)	28.5% (2,617)	27.9% (2,238)
Limited English Proficiency	22.3% (3,463)	20.4% (1,872)	19.4% (1,562)
Free or Reduced-Price Lunch	57.5% (8,927)	55.8% (5,122)	55.2% (4,422)
Students with Disabilities	8.7% (1,344)	10.0% (879)	10.0% (791)
Gifted and Talented	6.0% (926)	7.9% (723)	8.0% (639)

Note. Number of students shown in parentheses; limited English proficiency includes students ever classified as English learners.

PSAT scores. Table 2 displays mean PSAT scores obtained by students in the eight-year cohort as well as standard errors within the parentheses. Overall, the cohort registered total scores of 907.8, 453.5, and 454.3 for total, EBRW, and math, respectively; these scores correspond to approximately the 48th, 46th, and 46th national percentiles (College Board, 2015). There were group-level differences in PSAT performance, particularly with Asian students and students identified as gifted and talented registering higher scores, on average, than their peers. African American students, on average, scored lower than their peers overall (832.2), in EBRW, (413.2) and in math (419).

Table 2

Mean PSAT Scores and Standard Errors for BCPS Eight-Year Cohort

Characteristics	**Total Score**	**EBRW**	**Math**
Total Cohort	907.8 (1.7)	453.5 (1.0)	454.3 (0.9)
Gender			
Female	913.0 (2.3)	463.1 (1.3)	449.9 (1.2)
Male	902.6 (2.5)	444.0 (1.4)	458.6 (1.3)
Race			
African American	832.2 (2.3)	413.2 (1.3)	419.0 (1.2)
Asian	1030.1 (10.1)	509.3 (5.0)	520.7 (5.7)
Multiracial	937.0 (7.3)	471.5 (4.4)	465.6 (4.2)
Native American	890.8 (11.3)	442.7 (6.1)	448.1 (6.1)
Pacific Islander	901.3 (31.7)	459.3 (16.5)	442.0 (19.9)
White	952.1 (2.3)	477.7 (1.3)	474.4 (1.2)
Ethnic Hispanic	916.9 (3.0)	459.0 (1.7)	457.8 (1.6)
Limited English Proficiency	870.2 (3.5)	430.5 (2.0)	439.7 (1.9)
Free or Reduced-Price Lunch	859.9 (2.0)	427.4 (1.1)	432.5 (1.1)
Students with Disabilities	780.9 (4.0)	380.7 (2.2)	400.2 (2.3)
Gifted and Talented	1155.4 (5.3)	580.7 (2.8)	574.7 (3.1)

Note. Standard error shown in parentheses; EBRW = evidence-based reading and writing.

Students meeting or exceeding college readiness benchmarks. Table 3 shows the percentage of students in the eight-year cohort who met the College Board's college readiness benchmarks in EBRW and math. Interestingly, the on-track-to-college readiness rate for EBRW (86%) was nearly twice that for math (44%). In terms of scale score points, the EBRW score (360) was 110 points lower than math (470; not shown). This apparently easier criterion for EBRW is a point of concern, as it is in apparent misalignment with other ELA criteria such as previous college readiness indicators of the SAT and the performance level criteria of the Florida Standards Assessment (discussed below).

Table 3

Percentage of BCPS Students Meeting College Board PSAT College Readiness Benchmarks, Eight-Year Cohort

Characteristics	**EBRW**	**Math**
Total Cohort	85.6% (7,862)	43.9% (4,031)
Gender		
Female	89.5% (4,108)	42.1 (1,932)
Male	81.7% (3,754)	45.7 (2,099)
Race		
African American	76.2% (2,638)	26.6% (932)
Asian	94.8% (331)	69.3% (242)
Multiracial	90.8% (363)	49.0% (196)
Native American	83.9% (167)	43.7% (87)
Pacific Islander	100.0% (15)	33.3% (5)
White	91.3% (4,348)	54.0% (2,569)
Ethnic Hispanic	88.3% (2,312)	45.8% (1,198)
Limited English Proficiency	80.9% (1,515)	37.3% (698)
Free or Reduced-Price Lunch	80.8% (4,141)	33.6% (1,723)
Students with Disabilities	60.2% (540)	17.8% (160)
Gifted and Talented	99.4% (719)	91.3% (660)

Note. Number of students shown in parentheses; EBRW = evidence-based reading and writing.

Relationship between PSAT and state assessments. Figure 8 displays the scatter plot denoting the relationship between Grade 5 Florida Comprehensive Assessment Test (FCAT) reading scores and 10th-grade PSAT total scores. The plot suggests a moderate correlation, r=0.71.

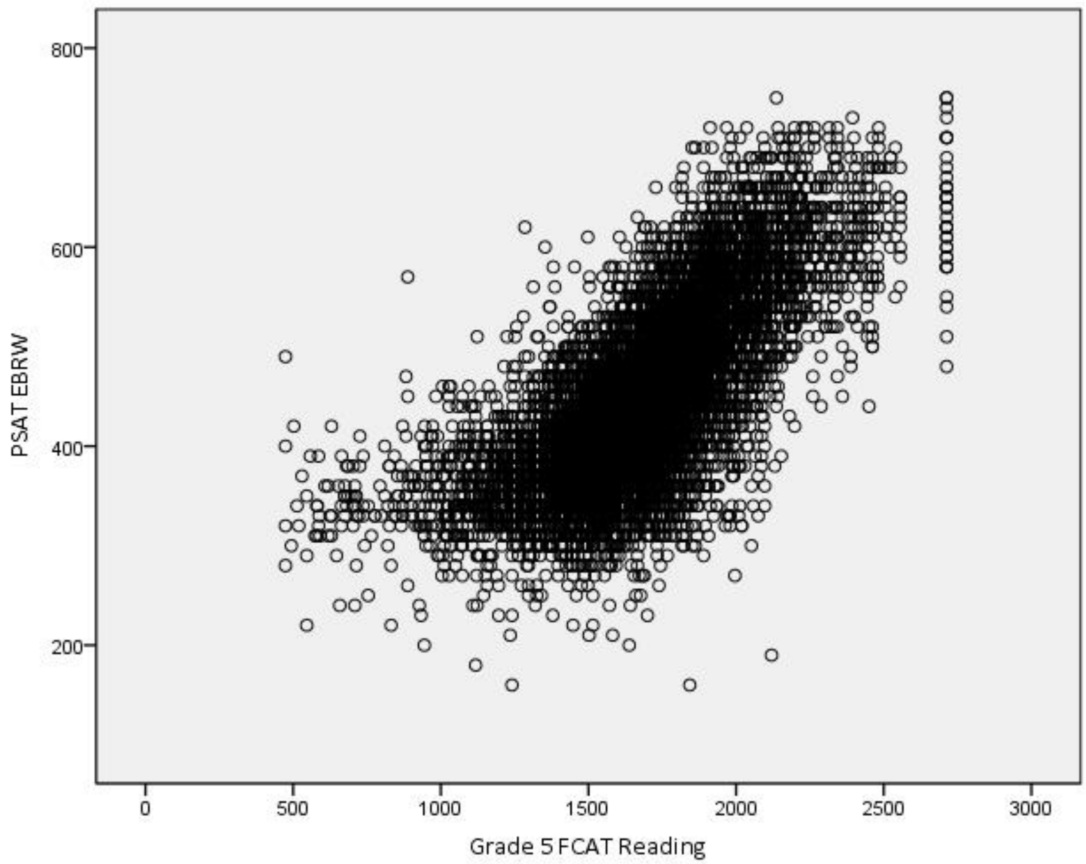

Figure 8. Scatterplot of BCPS PSAT total scores versus Grade 5 FCAT reading scores.

Table 4 displays the correlations between the 2015–2016 Grade 10 PSAT and all prior year state assessments. Student counts differ from Table 1 due to missing test scores. Not surprisingly, the further removed in time the state exam was from the PSAT, the lower the correlation. However, even state exams taken during Grade 3 correlated substantially with the corresponding PSAT subject area (2008–2009 FCAT reading to PSAT EBRW = 0.66; FCAT math to PSAT math = 0.63).

Table 4

Correlations Between PSAT Scores and Prior State Assessment Scores

School Year	State Exam Subject	PSAT Total		EBRW		Mathematics	
		r	***N***	***r***	***N***	***r***	***N***
2008–2009	FCAT Reading	.64	9034	.66	9034	.53	9034
	FCAT Math	.68	9030	.63	9030	.63	9030
2009–2010	FCAT Reading	.68	9150	.69	9150	.57	9150
	FCAT Math	.70	9147	.64	9147	.66	9147
2010–2011	FCAT Reading	.71	9150	.72	9150	.58	9150
	FCAT Math	.74	9152	.68	9152	.69	9152
2011–2012	FCAT Reading	.75	9101	.76	9101	.62	9101
	FCAT Math	.78	9147	.73	9147	.72	9147
2012–2013	FCAT Reading	.74	9117	.76	9117	.62	9117
	FCAT Math	.74	8069	.67	8069	.66	8069
	Algebra 1 EOC	.64	1092	.50	1092	.64	1092
2013–2014	FCAT Reading	.76	9110	.78	9110	.63	9110
	FCAT Math	.67	5752	.61	5752	.56	5752
	Algebra 1 EOC	.62	2312	.50	2312	.61	2312
	Geometry EOC	.69	1049	.56	1049	.69	1049
2014–2015	FSA English Language Arts	.78	8935	.80	8935	.65	8935
	Algebra 1 EOC	.60	5113	.54	5113	.50	5113
	Geometry EOC	.69	2021	.55	2021	.67	2021
	Algebra 2 EOC	.76	1117	.62	1117	.76	1117

Note: All correlations are significant at the 0.01 level (2-tailed); EBRW = evidence-based reading and writing; FCAT = Florida Comprehensive Assessment Test; FSA = Florida Standards Assessment; EOC = end-of-course exam.

Future PSAT success across middle schools. The remainder of the discussion focuses on middle school reading/English language arts as a demonstration. The logic also applies to mathematics and elementary schools. Figure 9 displays a scatter plot of Grade 5 (pre-middle school) FCAT reading versus Grade 10 PSAT EBRW. For this graph, aggregated school data provided the unit of analysis. To facilitate interpretation, both FCAT and PSAT scores were standardized relative to the district mean. Only students who were enrolled in the same middle school from Grades 6–8 were included; students who changed schools were excluded from this summary. Figure 9 echoes the general pattern noted with the individual student data: Performance of students prior to entering middle school is strongly related to future PSAT performance. This relationship is evident at both the school level ($r(40) = 0.95$) and the individual student level ($r(7838) = 0.71$).

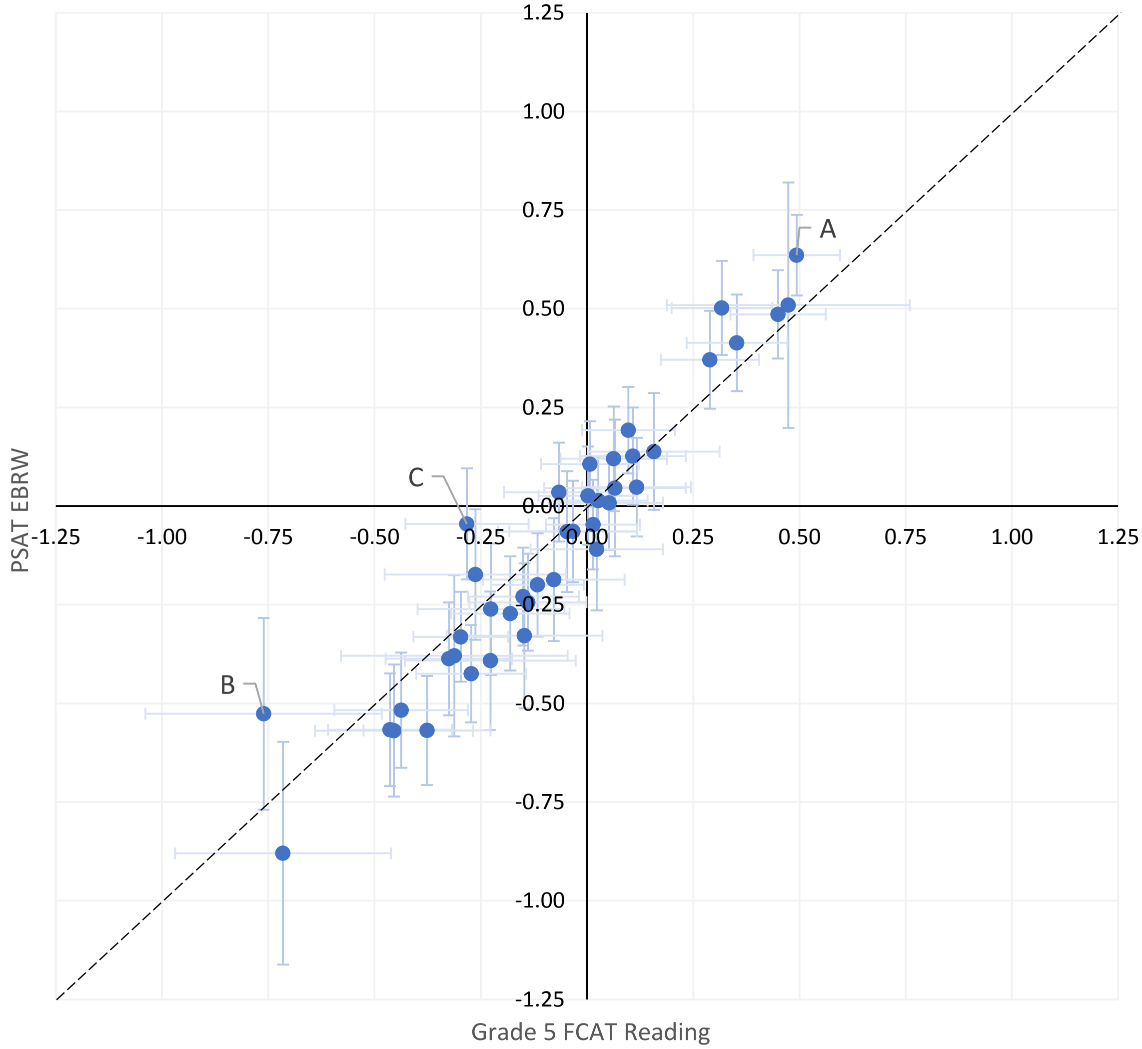

Figure 9. BCPS middle school average PSAT EBRW score versus Grade 5 FCAT reading score.

The error bars in Figure 9 denote two standard errors; they indicate that the differences between schools in terms of both incoming students' prior ability and later PSAT performance are not trivial. However, closer inspection of the figure shows that in terms of future PSAT performance, some students do, in fact, seem to benefit from attending particular schools. For instance, students attending School A entered with scores approximately one-half standard deviation above the district mean, but improved to nearly two-thirds (0.64) standard deviations above the district mean on the PSAT EBRW. In a similar vein, students attending School B entered Grade 6 with scores 0.76 standard deviations below the district mean, but improved to 0.53 standard deviations below the mean for the Grade 10 EBRW subtest.

Even schools not at the extreme in performance can show substantial improvement. Students attending School C entered middle school more than a quarter standard deviation below the district average, but improved to near the district average for PSAT performance. Average changes from pre-middle school reading achievement to PSAT EBRW were as great as a 0.24 standard deviation increase and a -0.19 standard deviation decrease.

Additional school benefits. Although the scatterplot suggests that students who attended certain schools were more likely to be successful when they reached the PSAT, this analysis suffers from several issues. First, there is an additional year of instruction (and growth) between the Grade 8 and Grade 10 PSAT. Because each middle school predominately feeds students to one or two high schools within the same area, observed benefits may be due to instruction at the high school instead of the middle school. Second, strong correlation between student prior achievement and PSAT scores may mask the true effect of the school. To address these issues, multilevel modeling was conducted.

The multilevel model again used students who were not mobile during middle school. Grade 5 FCAT reading scores served as a pretest covariate. To find an appropriate posttest score, the following procedure was employed: PSAT EBRW scores were linked by means of logistic regression to Grade 9 FSA ELA scores to find corresponding on-track-to-college-readiness criteria. In turn, these scores were linked to Grade 8 FCAT reading scores to post-middle school on-track-to-college readiness criteria. The Grade 9 on-track FSA ELA criterion was found to be 2.81 (below the Florida Department of Education "satisfactory" score of 3.00) and the Grade 9 criterion for the FCAT reading test was found to be 3.30.

The middle school data were subjected to multilevel modeling using the HLM package (Version 7.01; Raudenbush, Bryk, & Congdon, 2013). As the outcome variable was binary (on track for college readiness at end of eighth grade: Yes, No), the Bernoulli distribution of outcome variables was specified with a log linking function (Raudenbush & Bryk, 2002). Fifth-grade FCAT reading scores, grand mean centered, served as the covariate accounting for prior ability. The model was constructed using stepwise procedures to identify a set of student- and school-level variables that optimally described the data. The final model included free or reduced-price lunch (FRL), which was grand mean centered at Level 2 accounting for school-wide socioeconomic status and the percentage of students identifying as ethnically Hispanic. The model specifications were:

Level 1 Model

$$\text{Prob}(ELAGD8CR_{ij}=1|\beta_j) = \phi_{ij}$$

$$\log[\phi_{ij}/(1 - \phi_{ij})] = \eta_{ij}$$

$$\eta_{ij} = \beta_{0j} + \beta_{1j}*(5^{th}\ Grade\ Reading_{ij})$$

Level 2 Model

$$\beta_{0j} = \gamma_{00} + \gamma_{01}*(Percent\ Hispanic_j) + \gamma_{02}*(Percent\ FRL_j) + \gamma_{03}*(Mean\ 5^{th}\ Grade\ Reading_j) + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

The specified model accounted for 75% of variance relative to the unconditional model. Model summary results are shown in Table 5.

Table 5

Summary of Multilevel Analysis of BCPS Middle School ELA Effects

Final estimation of fixed effects (unit-specific model with robust standard errors)

Fixed Effect	**Coefficient**	**Standard Error**	***t*-ratio**	**Approx. *d.f.***	***p*-value**	**Odds Ratio**	**Confidence Interval**
For INTRCPT1, β_0							
INTRCPT2, γ_{00}	1.268562	0.043353	29.261	37	<0.001	3.555736	(3.257,3.882)
ETHNIC_P, γ_{01}	0.009254	0.004247	2.179	37	0.036	1.009297	(1.001,1.018)
FRL_PGT, γ_{02}	-0.010799	0.004556	-2.37	37	0.023	0.989259	(0.980,0.998)
DSSFCREA, γ_{03}	-0.001941	0.001161	-1.671	37	0.103	0.998061	(0.996,1.000)
For DSSFCREA slope, β_1							
INTRCPT2, γ_{10}	0.008764	0.000186	47.063	7755	<0.001	1.008802	(1.008,1.009)

Final estimation of variance components

Random Effect	**Standard Deviation**	**Variance Component**	***d.f.***	χ^2	***p*-value**
INTRCPT1, u_0	0.21479	0.04613	37	75.08230	<0.001

Empirical Bayes estimates of the Level 2 intercept residual were interpreted as an unbiased index of the school effect. With students' prior ability (Grade 5 reading) and school-level context (Hispanic ethnicity and socioeconomic status) controlled, the previously identified top performing school (labeled "A" in Figure 10) fell to near the district average (17 out of 41). Conversely, School B rose to near the district mean, to 24th place. A school near the middle of the distribution ("C" in Figure 10) rose to the highest school effect in the mixed-level model. Figure 10 provides a plot of the empirical Bayes school effects, reverse transformed to a mean probability of PSAT success.

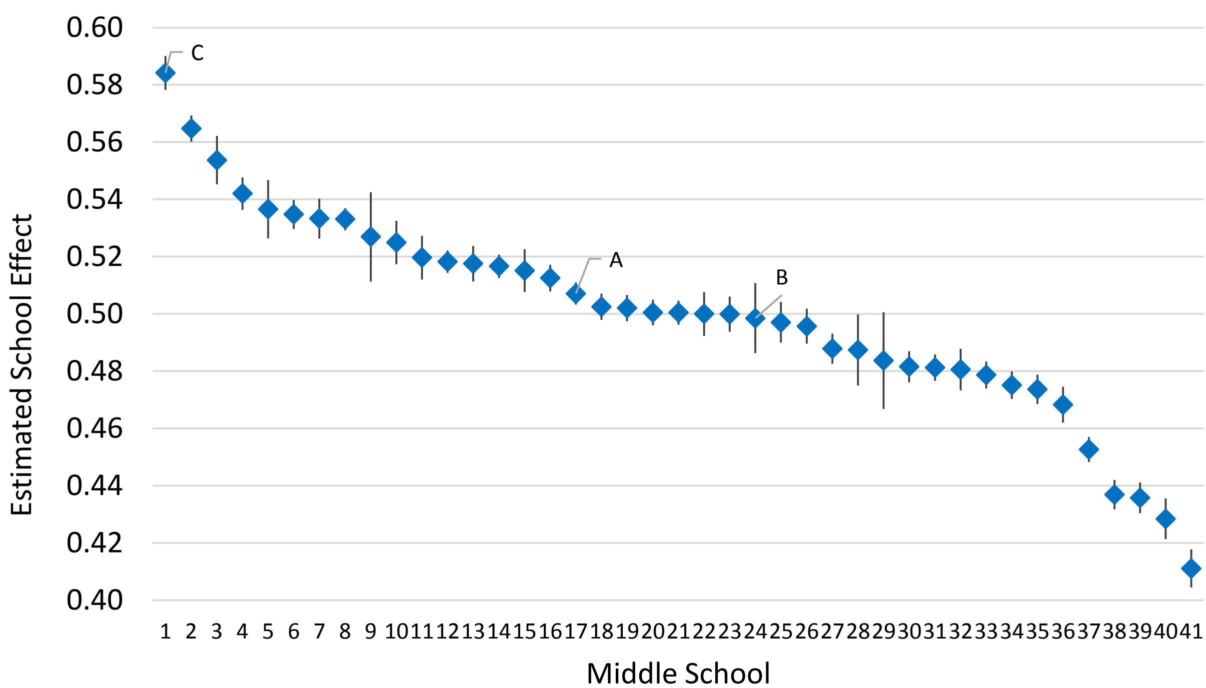

Figure 10. BCPS middle school value-added effects on probability of being on track for college readiness.

Next Steps

The analysis described above constitutes Phase 1 in this demonstration project. The procedure outlined provides a means to identify school sites that provide added value above expectation for helping students move towards being on track for college readiness by the end of middle school. A by-product of this analysis is identification of school sites with an average level of impact or even detrimental impact on student progress. The natural extension, then, is to classify schools as having a positive value-added impact, an expected impact, or a negative impact. This classification can then drive further investigation of the supportive features for enhancing student achievement.

BCPS will investigate school characteristics next. Potential factors to be examined include:

- **School climate and culture**. This must be examined from the perspective of both students and staff. Particular emphasis should be placed on safety, adult–student relationships, expectations for learning, role of leadership, and student attitudes (Kutsyuruba, Klinger, & Hussain, 2015).
- **Staff turnover**. The impact of staff turnover can have both positive and negative impacts on overall school performance depending on the reasons for turnover (Ronfeldt, Loeb, & Wyckoff, 2013). The removal of ineffective staff has the potential to improve overall student learning while the loss of experienced staff may decrease quality of instruction.
- **Leadership**. The school's principal and administrators are responsible for setting expectations for teachers and students (Brockmeier, Starr, Green, Pate, & Leech, 2013).
- **Specific interventions in place**. BCPS has a tradition of site-based management, giving latitude to principals to implement programs and instructional strategies that may not be widespread or known beyond the school site. Onsite study will afford an opportunity to uncover interventions and/or examine their impact with regard to fidelity of implementation.

Case Study 3:

Paterson Public Schools

Paterson Public Schools (PPS) is a diverse, urban school district located in northern New Jersey, 18 miles west of New York City. The third largest school district in New Jersey, PPS enrolls 29,400 students in preschool to Grade 12. The district's population mirrors the demographic trend of urban communities in New Jersey: 62% of all students are of Hispanic origin; 28% are African-American, and approximately 10% are of Caucasian, Middle Eastern, or Asian descent. Nearly 50% of all students in Paterson speak a primary language other than English, with a total of 37 languages spoken in district schools. The district currently has 54 schools with 2,526 certified teachers and contracts with 23 early childhood community providers to serve 3,400 three- and four-year-olds.

Policy/Research Issue

The first priority of the PPS strategic plan, Brighter Futures, is effective academic programs. The district believes all Paterson students can achieve at high levels and is fully committed to preparing all students for college and their future careers. The district will continue to implement a wide array of high impact interventions to accelerate student achievement (growth in test scores and graduation rates) and to help ensure students are comfortable with 21st-century learning skills. Toward this end, the district has identified five goals:

- Goal 1: Increase achievement levels—expected growth—by 20% for Grades 3–11 by 2019.
- Goal 2: Increase the graduation rate of students.
- Goal 3: Increase students' college preparedness.
- Goal 4: Create student-centered supports where all students are engaged in school.

- Goal 5: Promote technology and 21st-century learning.

In support of the strategic plan, the district is participating in the SDP Fellowship to build the data capacity of staff and stakeholders. For this project, the district identified an existing staff member to become an SDP Fellow in order to focus on indicators of student achievement in the early grades (preschool to Grade 3, or pre-K–3). The SDP Fellow works as a data specialist in the Department of Early Childhood Education and is responsible for providing data analyses that are used to drive curricular changes in the preschool program.

Through state-mandated preschool, PPS has sought to ensure that its youngest children are healthy, safe, and ready for school success. In 1999, the district established broad partnerships with a myriad of childcare, preschool, and social services available throughout the community. The goal was to provide opportunities for collaboration from the organizational to the classroom level. To date, the district has been successful in getting stakeholders to the table, but has yet to develop a system of coordinated and aligned standards, instruction, assessment, and meaningful family engagement in pre-K–3. As part of the district's strategic plan, a pre-K–3 literacy initiative was designed to meet effective academic programs in the early grades. This initiative is focused on increasing the number of students reading on level at the end of Grade 3 through a variety of instructional strategies.

Prior to this project, there had been no wide-scale attempt to create longitudinal data sets linking demographic and student achievement data in pre-K–3. The was due to the difficulty in collecting and linking information contained in separate databases and the lack of dedicated staff to collect and analyze it. Early childhood classrooms are spread among 35 in-district school buildings and 23 community preschool providers, and so discussions on student achievement are typically focused on individual grades in individual schools. As a result, there has been no systematic feedback mechanism in place to provide teachers from the prior grade on their students' level of success in the next grade. This is especially true at the preschool level, where student assessment is done by teacher-created portfolios and a majority of preschool classrooms are not within district school buildings.

Since high stakes testing begins at the end of third grade, student performance in the early grades lacks a common language for discussion. Data analyses could facilitate better vertical articulation between grades, the identification of areas for targeted teacher professional development, an investigation into the usefulness of student interventions, and assessments of curricular programs. Individual and aggregate student data will provide a common language for these purposes. In particular, data from this project will inform conversations on student achievement between early childhood educators and community partners.

Project Scope

PPS set out to develop a method to systematically collect longitudinal student data beginning in preschool with annual updates as students move through the grades. Focusing on the early grades has been a challenge, and gathering data has been a learning experience. Much time was spent cleaning student information and assessment data to create large data sets linked by student ID numbers. In the end, district information produced four cohorts of students who began kindergarten in September 2012, 2013, 2014, and 2015, for a combined total of approximately 8,000 students. Student demographic information collected includes gender, ethnicity, school attended, English language learner status, special needs status, preschool enrollment, school lunch status, age, grade level, and attendance. Assessment data—including WIDA-ACCESS placement test scores, Renaissance Learning Star Early Literacy and Reading scores, Teaching Strategies GOLD preschool child assessment scores, and school report card grades—were linked using R scripts.

Students in K–3 are assigned an at-risk literacy status at the beginning of each grade using Renaissance Learning Star Early Literacy and Renaissance Learning Star Reading. Star Early Literacy and Star Reading are computer-adaptive assessment instruments designed to measure literacy skills of students in the early grades. They are used to determine children's mastery of literacy concepts that are directly related to their future success as readers.

Star Early Literacy assesses proficiency in three broad domains—word knowledge and skills, comprehension strategies and constructing meaning, and numbers and operations—that include 10 key early literacy subdomains involving 41 different sets of skills or concepts. Star Early Literacy is used to assess children in kindergarten and first grade. Star Reading assesses proficiency in four broad domains—foundational skills, reading literature, reading informational text, and language—and includes 46 reading skill areas. It is used to assess children in second and third grades.

To interpret screening results, the district uses benchmarks based on percentile rank. These scores help educators identify which students would benefit from strategic interventions to accelerate growth and move toward proficiency, and which students are already considered high performing. The district has defined the at-risk literacy categories as outlined in Table 6 below.

Table 6

PPS At-Risk Literacy Category Definitions

Literacy At-Risk Status	**Star Early Literacy K & Grade 1 Fall % Rank**	**Star Reading Grades 2 & 3 Fall % Rank**
Needs urgent intervention	< 20	< 10
Intervention needed	21–39	10–24
On watch	40–54	25–39
Proficient	55–74	40–74
Advanced proficient	75–100	75– 00

Originally the plan was to create a regression model to look for indicators associated with a student's reading on grade level at third grade using the longitudinal data set and the New Jersey Achievement of Skills and Knowledge in third grade (NJASK 3). This plan was modified when it was determined that a complete set of K–3 Star Early Literacy data was not available. Instead, the analyses looked at the differences in percentages of students in each at-risk literacy category by subgroup for specific grades. These analyses will be the basis of curricular conversations between stakeholders. In the future, as more data become available, the district will revisit the idea of using data to systematically identify at-risk students. The ultimate goal is for stakeholders using data to drive improvement to curriculum implementation, and to more clearly identify students who would benefit from interventions.

Results

Initial data analyses indicate there may be a role for longitudinal data when developing instructional strategies for students in the early grades and, as a result, improve student achievement. As noted in the position statement of National Association for the Education of Young Children (NAEYC, 2009), "Development and learning proceed at varying rates from child to child, as well as at uneven rates across different areas of a child's individual functioning." Recognizing variations in academic student growth, teachers need to make curricular decisions based on individual appropriateness and should not expect all students to fit into a group norm. For this reason, using multiple criteria when predicting at-risk students may be more appropriate. The data below present examples where using multiple criteria may drive instructional practice.

Each September, kindergarteners are assessed using Star Early Literacy. Students with scaled scores above 529 are considered kindergarten ready. All the students in Figure 11 below fell into this category. This group was divided by eligibility for free or reduced-price lunch. If we considered only kindergartener readiness, we would expect the groups to have a similar distribution of at-risk percentages when entering first grade. However, we found differences between the two groups. Looking solely at this indicator would not provide enough information on which students require interventions to make adequate growth.

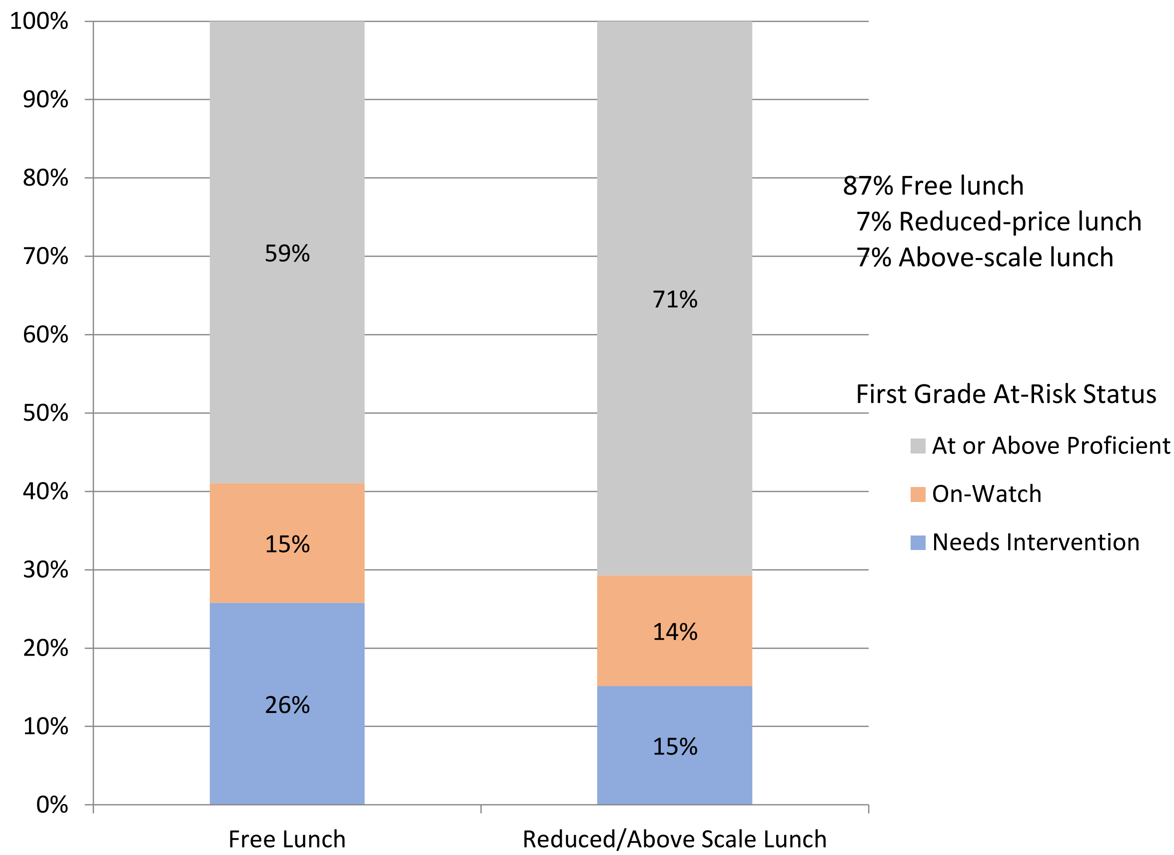

Figure 11. At-risk literacy status of kindergarten-ready first graders in PPS by type of eligibility for free or reduced-price lunch (*N* = 735).

Figure 12 shows the change in at-risk literacy status as English language learners (ELL) and non-ELL students transition from kindergarten to first grade. The change is an indication of academic growth rate. A high growth rate will allow a student to improve upward in an at-risk category, while a low growth rate will cause a student to slip downward. Looking solely at the overall change in status from kindergarten to first grade for the two groups misses useful information. Students with different at-risk literacy statuses at the beginning of kindergarten experience different academic growth rates. Although not considered at risk by the kindergarten assessment, at/above proficiency ELL students might benefit from additional support since, in this sample, 64% fell at least one category when moving from kindergarten to first grade.

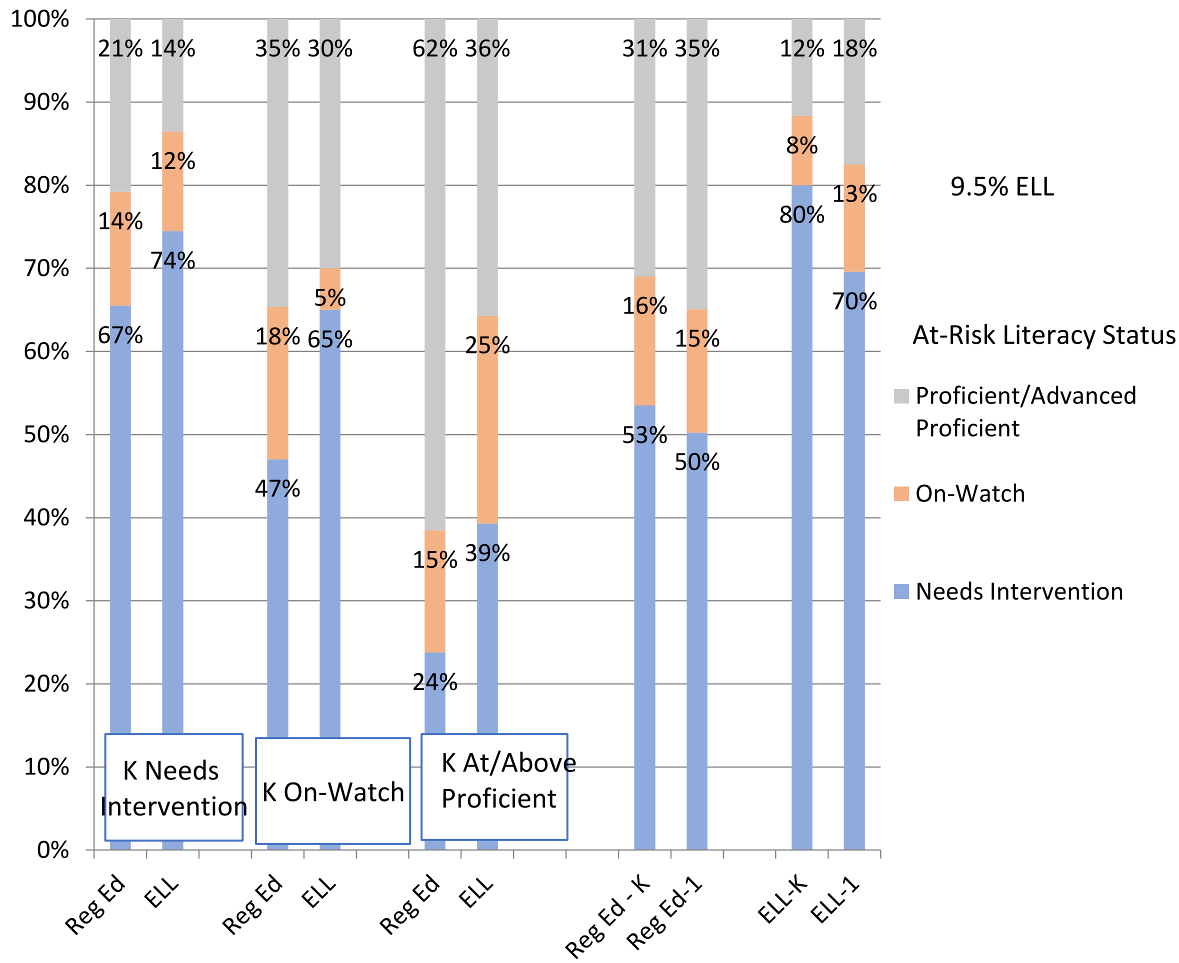

Figure 12. At-risk literacy status as students transition from kindergarten to Grade 1, by English language learner status (N = 2,523).

Finally, Figure 13 looks at the change in at-risk literacy status from kindergarten to third grade by comparing a group of students who attended the entire state-mandated preschool to those who did not. The district provides preschool education to three- and four-year-old children residing in Paterson. The program follows the school calendar and classrooms are staffed with certified teachers. The classrooms are found in community provider settings and district school buildings, and parents can choose to enroll their children for any portion of the program, from one to 20 months.

At the start of kindergarten, the groups were distinct, with differing percentages in each risk category. For example, 66% of those who did not attend the preschool required intervention; 49% of those who attended needed it. By the time these same students began third grade, the differences between the groups had disappeared and they had very similar percentages in the three at-risk literacy categories. It appears that students without preschool had higher student growth rates then students who attended the PPS preschool.

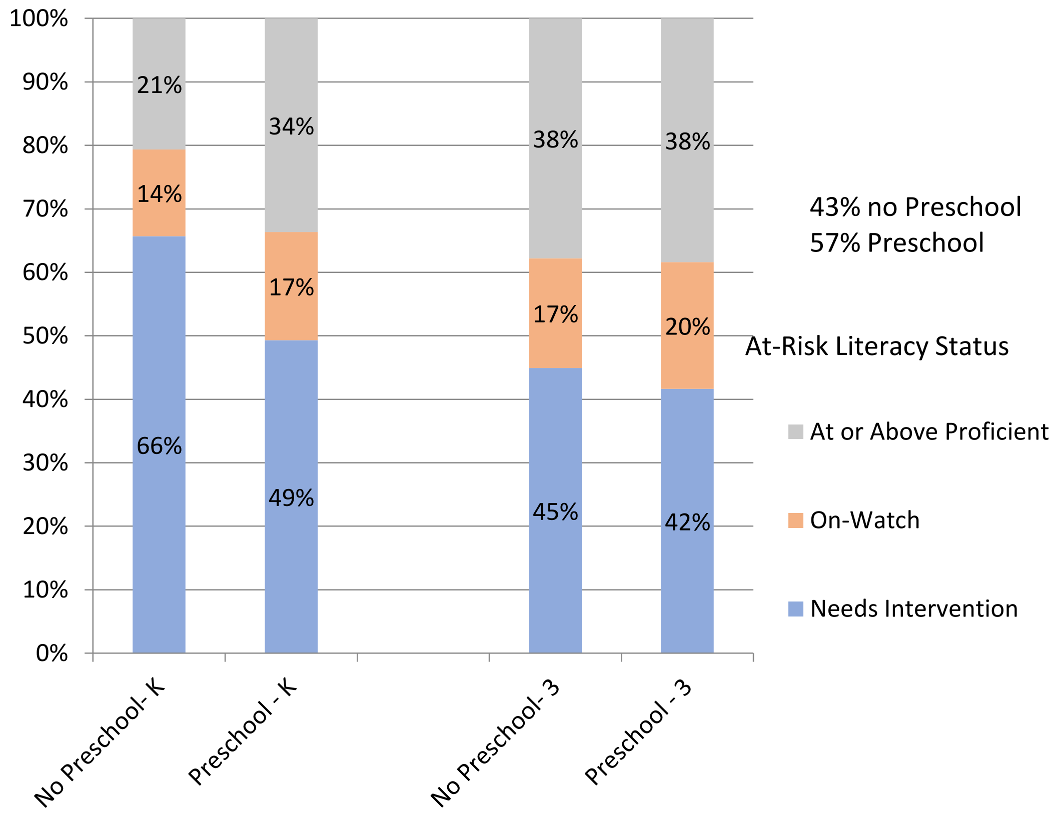

Figure 13. Change in at-risk literacy status from kindergarten to Grade 3 by PPS preschool enrollment (*N* = 926).

The common theme that ties all of these analyses together is the difference in interpretation when one views data longitudinally instead of in isolation. Longitudinal data make it possible to provide relevant information to help teachers adjust instruction to meet the needs of students, to allow administrators to monitor school-wide action plans, and to enable program directors to assess curriculum implementation.

Next Steps

The longitudinal data sets in this project will be updated each school year and a new cohort of kindergarten students will be added. As more data are collected, additional analyses will be possible. Once enough preschool assessment and demographic information is gathered, it may be possible to model kindergarten readiness. Renaissance Learning Star Early Literacy provides kindergarten readiness data that would be beneficial to preschool teachers; it could provide feedback on students' at-risk status once they begin first grade. Teaching Strategies GOLD assessment data may provide kindergarten teachers with strengths and weaknesses of their incoming students. Collecting more information on English language learners may be useful in the evaluation of the district's bilingual program. In general, longitudinal data may help program directors and principals determine the effectiveness of student interventions, create professional development plans, and provide feedback to literacy coaches working in the building.

The team must still determine systematic ways to disseminate data throughout the district in a format that encourages teacher discussions. The roll-out will begin in preschool. Each year the Department of Early Childhood submits a plan to the New Jersey Department of Education that describes how it will create a smoother transition between preschool and kindergarten in terms of curriculum alignment, standards, assessment, and professional development. Data from this project could be used for this purpose. However, there are logistical issues to manage due to the size of the audience. This is especially true in preschool where more than 200 teachers are spread over 23 locations in community provider settings. Creating settings for teachers and community providers to talk about pedagogy using achievement data is difficult. There has been some success in the district using the professional learning community model.

Case Study 4:

IDEA Public Schools

IDEA Public Schools is a growing network of tuition-free pre-K–12 public charter schools that now serves more than 24,000 students in 44 schools throughout the Rio Grande Valley, Austin, and San Antonio, Texas. IDEA is committed to “college for all children,” and for the past nine years, 100% of its graduating seniors have been accepted to postsecondary institutions. As IDEA Public Schools continues to expand and serve more students, it faces a greater need to ensure all IDEA Scholars persist in college. As of August 2016, National Student Clearinghouse (2016b) data show that the average three-year college persistence rate for the classes of 2007 to 2013 was 48%. In order for IDEA to increase college persistence among its alumni, it needs to intervene with students as early as possible. With this in mind, this case study aimed to identify key indicators of future college persistence for students enrolled in Grades 9–12 at IDEA Public Schools.

Policy/Research Issue

Although 100% of IDEA alumni matriculate into college, the six-year university graduation rates for the classes of 2008 and 2009 are 53% and 31%, respectively (National Student Clearinghouse, 2016a). Interventions by the College Success Team largely happen with students after high school graduation. Students identified for intervention have already dropped to half-time college-going status, failed a college course, transferred out of a higher-tier college, or self-identified as being in need of assistance. Currently, college persistence and completion interventions do not happen with Grade 9–12 students. By identifying these indicators earlier in a student's career, students will be better prepared for college and require fewer interventions once they are there. This should lead to higher college persistence rates.

Project Scope and Methods

Originally, IDEA Public Schools set out to use the High School Correlate of Secondary and Postsecondary Success identified in the College and Career Readiness and Success Center's Predictors of Postsecondary Success (Hein & Smerdon, 2013). However, the research and analysis team found that many of the indicators would not be valuable because IDEA Public Schools currently has programs where all students receive certain postsecondary success treatments. For example, all IDEA students participate in college knowledge target outreach programs and early assessment and intervention programs, complete the Free Application for Federal Student Aid (FAFSA) and the Texas Application for State Financial Aid (TASFA), and pass state end-of-course assessments. Therefore, the team decided to use all available data points that could be correlated to student consecutive persistence in college for three or more years, as reported by the National Student Clearinghouse.

A total of 95 indicators that are currently collected by IDEA Public Schools were identified. Information focused on AP testing, Grade 9–12 attendance, GPA, core course grades, and state standardized testing results. Several indicators were real-time, such as attendance and GPA; others occurred less often, such as tests results and final course grades. It was important to use indicators that the team routinely collects and reports. This made the continued collection and future use of the data much easier.

Six-year college persistence was originally the intended outcome, but the data only allowed for three-year college persistence. Future data collection protocols will allow IDEA Public Schools to track four- and five-year college persistence and six-year college completion.

In the interim, the team correlated all 95 variables to three-year college persistence. Pearson correlations were run for all variables against three-year college persistence.

Analysis

Of the 95 variables collected, 34 proved to be statistically significant at a .01 significance level. Table 7 shows the Pearson correlation values for all variables against three-year college persistence.

Table 7

Indicators of Three-Year College Persistence Among IDEA Alumni

Variable	**Correlation**
Grade 9 Attendance	.095**
Grade 11 Attendance	.153**
Cumulative GPA	.341**
Grade 9 Math Course Grade	.217**
Grade 9 ELA Course Grade	.193**
Grade 9 Science Course Grade	.214**
Grade 9 Social Studies Course Grade	.211**
Grade 10 Math Course Grade	.245**
Grade 10 ELA Course Grade	.267**
Grade 10 Science Course Grade	.165**
Grade 10 Social Studies Course Grade	.256**
Grade 11 Math Course Grade	.261**
Grade 11 ELA Course Grade	.334**
Grade 11 Science Course Grade	.255**
Grade 11 Social Studies Course Grade	.277**
Grade 12 Math Course Grade	.263**
Grade 12 ELA Course Grade	.355**
Grade 12 Science Course Grade	.214**
Grade 12 Social Studies Course Grade	.302**
Grade 9 Math Pass	.094**
Grade 9 Math Advanced	.161**
Grade 9 Reading Advanced	.139**
Grade 9 Writing Advanced	.111**
Grade 9 Science Pass	.153**
Grade 9 Social Studies Pass	.140**
Grade 10 Math Pass	.087**
Grade 10 Math Advanced	.163**
Grade 10 Reading Pass	.097**

Grade 10 Reading Advanced	.107**
Grade 10 Writing Pass	.179**
Grade 10 Science Pass	.123**
Grade 10 Science Pass	.127**
Grade 10 Social Studies Pass	.127**
Grade 10 Social Studies Advanced	.137**

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

AP indicators. At IDEA Public Schools, all students are required to take AP exams beginning as early as eighth grade with AP Spanish Literature. Students take 11 AP courses in the same sequence and the AP exam for every course. Passing three exams was identified as being statistically significant (Table 8). Currently at IDEA Public Schools, 20% of graduates have passed a minimum of three AP exams, making them “AP Scholars.”

The three AP tests that are highly significant to college persistence among IDEA alumni are U.S. Government and Politics, English Language Composition, and Microeconomics. This suggests that IDEA Public Schools should continue to monitor and track the AP Scholar goal, and emphasize the specific AP tests identified. The core skills required to pass these tests should be further investigated to learn why and how they are correlated to college persistence.

Table 8

Correlation of AP Indicators with IDEA Alumni Three-Year College Persistence

Variable	**Correlation**
Passing AP US Government and Politics	.147*
Passing AP English Language Composition	.116*
Passing AP Microeconomics	.184*
3 AP Exams Passed	.075*
Grade 10 Attendance	.068*
Grade 9 Reading Pass	.086*

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Attendance. At IDEA Public Schools there is an attendance rate goal of 97.5% for all students. Our preliminary analysis shows that students who persist in college have over a .50% higher attendance rate in Grades 9–11 than students who do not persist. Table 9 represents the median attendance rates by grade level for students who persist and those who do not.

Table 9

IDEA Alumni Grade 9–11 Attendance by Three-Year College Persistence

	Mean Attendance Rate		
Grade	**Persisting Students**	**Non-Persisting Students**	**Difference**
Grade 9	97.89%	97.38%	.51%
Grade 10	98.11%	97.38%	.73%
Grade 11	98.09%	97.35%	.74%

Interestingly, the difference in 12th-grade attendance rates did not prove to be significant. One possible explanation for this could be the added emphasis and tracking of attendance for 12th-grade students by campus staff. A stronger emphasis on 12th-grade attendance and very similar attendance rates among 12th-grade students could explain why it is not correlated significantly to college persistence. It may be appropriate to revisit the attendance rate goal for the organization. A higher threshold should be set to identify students at risk of not persisting in college.

Cumulative GPA. Strong academic achievement in high school courses seems to translate into college persistence. Specifically, high school GPA proved to be a strong indicator of college persistence. The median cumulative GPA for students who persisted was 3.264, compared to a median of 2.892 for those who did not. IDEA Public Schools currently tracks students who fail classes, but there is no reporting done around GPA tracking. Beginning to track and monitor student GPA in addition to failure of classes could be beneficial. If IDEA Public

Schools can assist students when they begin to struggle in high school courses, it could prepare them to struggle less in college courses.

Core course grades. Students' core course grades were significant indicators of college persistence. The difference in individual course grades between students who persisted and those who did not ranged from 3 to 7 points (see Table 10). This is not very surprising, since students who perform better in high school courses appear to persist in college.

Table 10

Core Course Grades of IDEA Alumni by Three-Year College Persistence

	Median Course Grades		
High School Course	**Persisting Students**	**Non-Persisting Students**	**Difference**
Grade 9 ELA	85	82	3
Grade 9 Math	79	84	5
Grade 9 Social Studies	85	81	4
Grade 9 Science	85	81	4
Grade 10 ELA	87	82	5
Grade 10 Math	84	80	4
Grade 10 Social Studies	87	82	5
Grade 10 Science	86	82	4
Grade 11 ELA	86	81	5
Grade 11 Math	84	79	5
Grade 11 Social Studies	85	80	5
Grade 11 Science	85	80	5
Grade 12 ELA	86	79	7
Grade 12 Math	84	79	5
Grade 12 Social Studies	86	81	5
Grade 12 Science	84	80	4

State standardized tests. The ninth- and 10th-grade state standardized assessments were significantly correlated to college persistence. Interestingly, the final 11th-grade state assessments were not correlated to college persistence. This is notable because historically IDEA has emphasized the importance of final 11th-grade state assessments, as this is a graduation requirement. In the context of college persistence, passing state assessments has not been a focus area to ensure students are prepared for college. Tables 11 and 12 show the Pearson correlation values of the statistically significant assessments.

The Texas Education Agency (TEA) transitioned to the State of Texas Assessment of Academic Readiness (STAAR) assessment in the 2011–2012 school year. As part of the transition, TEA created standards on college readiness that include STAAR benchmarks. Future analyses will be conducted to evaluate whether achieving these readiness standards has an impact on college persistence.

Table 11

Correlation of Grade 9 Assessments and IDEA Alumni Three-Year College Persistence

Indicator	**N**	**Pearson Correlation**	**Sig. (2-tailed)**
Math Pass	772	.094**	0.009
Math Advanced	772	.161**	0.000
Reading Pass	771	.086*	0.017
Reading Advanced	771	.139**	0.000
Writing Advanced	866	.111**	0.001
Science Pass	866	.153**	0.000
Social Studies Pass	863	.140**	0.000

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Table 12

Correlation of Grade 10 Assessments and IDEA Alumni Three-Year College Persistence

Indicator	**N**	**Pearson Correlation**	**Sig. (2-tailed)**
Math Pass	917	.087**	0.008
Math Advanced	934	.163**	0.000
Reading Pass	934	.097**	0.003
Reading Advanced	934	.107**	0.001
Writing Pass	866	.179**	0.000
Science Pass	931	.123**	0.000
Science Advanced	931	.127**	0.000
Social Studies Pass	931	.127**	0.000
Social Studies Advanced	917	.137**	0.000

** Correlation is significant at the 0.01 level (2-tailed)

Next Steps

Based on these findings, the chief executive officer and chief program officer have allocated resources for the development of a College Persistence Early Warning Indicator System. In the 2016–2017 school year, the research and analysis team will begin development of the system to identify students who are at risk of not persisting in college. The team will also conduct additional analyses to identify significant indicators to inform interventions for students. The findings here suggest IDEA Public Schools should:

- Monitor and track the AP Scholar goal, and conduct more research on specific AP tests (e.g., U.S. government and politics) correlated to college persistence because the characteristics and skills required to pass those exams may provide further insight into required skillsets for college persistence;
- Evaluate the need to differentiate attendance rate goals for students in specific grade levels and revisit the attendance rate goal of 97.5%, which is lower than the median attendance rate of ninth- through 12th-grade students who persist in college;
- Begin tracking GPAs and core course grades at the organizational level—through, for example, collaborative work to identify key targets for each course—as opposed to considering it teacher-oriented information;
- As new data are available, conduct an analysis on the STAAR assessment and college persistence outcomes for future graduates who are administered the STAAR assessment; and
- Continue to run the analyses each year when new college persistence data are available—as the quantity of observations increases, we expect to be able to make new and additional insights.

References

ACT Research and Policy. (2013). *What are the ACT college readiness benchmarks?* Iowa City, IA: ACT. Retrieved from https://www.act.org/content/dam/act/unsecured/documents/benchmarks.pdf

Brockmeier, L., Starr, G., Green, R., Pate, J., & Leech, D. (2013). Principal and school-level effects on elementary school student achievement. *NCPEA International Journal of Educational Leadership Preparation, 8*(1), 49–61.

College Board. (2015). *PSAT/NMSQT: Understanding scores 2015*. Retrieved May 30, 2016,

Florida Department of Education. (2015). *2014–15 guide to calculating informational baseline school and district grades*. Tallahassee, FL: Author. Retrieved from http://schoolgrades.fldoe.org/pdf/1415/SchoolGradesCalcGuide15.pdf

Florida Department of Education. (2016). *Florida standards assessment achievement level descriptions: 2015*. Tallahassee, FL: Author. Retrieved May 30, 2016, from www.fldoe.org/core/fileparse.php/5663/urlt/2015FSARangeSummary.pdf

Hein, V., Smerdon, B., & Sambolt, M. (2013). *Predictors of postsecondary success.* Washington, DC: American Institutes for Research. Retrieved from https://www.cde.state.co.us/postsecondary/americaninstitutesforresearchpredictorsofpostsecondarysuccess

Hernandez, D. J. (2011). *Double jeopardy: How third-grade reading skills and poverty influence high school graduation*. Baltimore, MD: Annie E. Casey Foundation.

Hess, F., & Meeks, O. (2010). *School boards circa 2010: Governance in the accountability era*. Alexandria, VA: National School Boards Association. http://files.eric.ed.gov/fulltext/ED515849.pdf

Kutsyuruba, B., Klinger, D., & Hussain, A. (2015). Relationships among school climate, school safety, and student achievement and well-being: A review of the literature. *Review of Education, 3*(2), 103–135. doi: 10.1002/rev3.3043

Mattern, D., Shaw J., & Xiong, X. (2009). *The relationship between AP exam performance and college outcomes*. New York, NY: College Board. Retrieved from https://research.collegeboard.org/sites/default/files/publications/2012/7/researchreport-2009-4-relationship-between-ap-exam-performance-college-outcomes.pdf

National Association for the Education of Young Children. (2009). *Position statement on developmentally appropriate practice in early childhood programs serving children from birth through age 8*. Washington, DC: Author. Retrieved from https://www.naeyc.org/files/naeyc/file/positions/position%20statement%20Web.pdf

National Center for Education Statistics. (2016). *The condition of education*. Washington, DC: U.S. Department of Education. Retrieved from https://nces.ed.gov/pubs2016/2016144.pdf

National Student Clearinghouse. (2016a). *StudentTracker for high schools: Aggregate report.*

National Student Clearinghouse. (2016b, April). *Three-year college persistence by graduating class.*

Oreopoulos, P., & Petronijevic, U. (2013). Making college worth it: A review of the returns to higher education. *Future of the Children, 23*(1), 41–65.

Parsad, B., & Lewis, L. (2003). *Remedial education at degree granting postsecondary institutions in fall 2000* (NCES 2004-010). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Pew Research Center. (2014). *The rising cost of not going to college*. Washington, DC: Author. Retrieved from http://www.pewsocialtrends.org/2014/02/11/the-rising-cost-of-not-going-to-college

Raudenbush, S., & Bryk, A. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.

Raudenbush, S., Bryk, A., & Congdon, R. (2013). HLM 7.01 [Computer Software]. Skokie, IL: Scientific Software International.

Shapiro, D., Dundar, A., Ziskin, M., Yuan, X., & Harrell, A. (2013). *Completing college: A national view of student attainment rates: Fall 2007 cohort* (Signature Report No. 6). Herndon, VA: National Student Clearinghouse Research Center.

Sparks, D., & Malkus, N. (2013). *Statistics in brief: First-year undergraduate remedial coursetaking: 1999–2000, 2003–04, 2007–08*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Trostel, P. (2015). *It's not just the money: The benefits of college education to individuals and to society*. Indianapolis, IN: Lumina Foundation.

U.S. Department of Education. (2006). *A test of leadership: Charting the future of U.S. higher education*. Washington, DC: Author. Retrieved from http://www2.ed.gov/about/bdscomm/list/hiedfuture/reports/final-report.pdf

U.S. Department of Education, Institute of Education Sciences (2009).2009 Reading Assessment. Retrieved from https://nces.ed.gov/nationsreportcard/pdf/main2009/2010458.pdf

Wolper-Gawron, H. (2011). What is the purpose of public education? *Huffington Post*. Retrieved from http://www.huffingtonpost.com/heather-wolpertgawron/what-is-the-purpose-of-pu_b_774497.html

Woods, M. L. (2016). *2014–15 Florida Standards Assessment (FSA) results*. Fort Lauderdale, FL: Broward County Public Schools. Retrieved from http://www.broward.k12.fl.us/sar/releases/reports/2014_15_FSA_Results.pdf

Wyatt, J. N., Kobrin, J. L., & Proestler, N. (2011). *SAT benchmarks: Development of a college readiness benchmark and its relationship to secondary and postsecondary school performance*. New York, NY: College Board. Retrieved from https://research.collegeboard.org/sites/default/files/publications/2012/7/researchreport-2011-5-sat-college-readiness-benchmark-secondary-performance.pdf