



STRATEGIC DATA PROJECT
SDP FELLOWSHIP CAPSTONE REPORT

**Using Data to Test Assumptions:
An Example from the Kentucky
Department of Education**

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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.*

USING DATA TO TEST ASSUMPTIONS KDE

Abstract

My role at the Kentucky Department of Education (KDE) is to monitor progress toward annual college and career readiness performance targets. One initiative toward achieving these targets is to provide student interventions to students who fail to meet performance benchmarks on the statewide college ready assessment. Historically, the culture of the agency was to assume that 1) schools followed the legislative requirement and provided interventions, and that 2) these interventions were effective.

As a data fellow, I used my role to question the validity of these two assumptions, showing that much needs to be done in the near future in order for KDE to meet future performance targets. Using data, I changed KDE leadership and staff's understanding of who receives interventions as well as their effectiveness. As a result of these findings, KDE implemented two initiatives. First, KDE created a Math Collaborative Workgroup that brings together all professional development initiatives statewide to identify gaps in the implementation of the Common Core Standards. Second, KDE assumed a more aggressive position to uphold legislative requirements to administer targeted interventions to students below benchmarks. To this end, KDE created a data collection initiative that will require administrators to provide intervention data for all students below benchmarks, which in turn will allow the state to monitor compliance with legislation.

Introduction and Project Vision

Nearly a decade after No Child Left Behind (NCLB) was enacted, the state of Kentucky saw little evidence that NCLB expectations were attainable. By 2010, 76 percent of Kentucky students graduated from high school, of which 34 percent were college ready. In other words, 2 out of every 3 high school graduates required remediation courses upon college entry (Kentucky Department of Education and Kentucky Council on Postsecondary Education, 2010).

In 2009, Kentucky responded with Senate Bill 1 (SB 1), which directed the Kentucky Department of Education (KDE) and Council for Postsecondary Education (CPE) to develop a new assessment and accountability model, and to create a unified plan to reduce the rate at which high school graduates required remediation courses upon college entry and increase college completion rates of students enrolled in one or more remedial classes. SB 1 identified several strategies to support these initiatives: 1) increase accelerated learning opportunities; 2) provide targeted interventions to students below benchmarks; 3) increase access to quality, college and career advising; and 4) increase college completion rates of students that require remediation courses.¹

In 2010, KDE responded to the SB 1 objectives when it secured the Commonwealth Commitment from all districts to increase the number of students who graduate high school college and/or career ready (CCR) from 34 percent in 2009-10 to 67 percent in 2014-15. Under the leadership of Commissioner Terry Holliday, KDE then developed a continuous improvement plan aligned to the SB 1 initiative to increase the CCR rate. Within KDE, the CCR plan instigated a culture of change, such that achievement expectations aligned to workforce and postsecondary outcomes provides educators and program staff with the tools necessary to improve upon student performance. Figure 1 presents the predicted impact of each strategy identified within the CCR plan.² The green boxes, which represent actual performance rates, suggest that Kentucky schools have made impressive gains. Since the CCR plan was developed, the rate at which students graduate from high school college *and/or* career ready increased from 34 percent in 2009-10 to 54.1 percent in 2012-13, suggesting that Kentucky was on the correct path to meet its 2015 goal.

¹ See Kentucky Department of Education and Kentucky Council on Postsecondary Education (2010).

² It is important to note that the trajectory combines two outcomes: college readiness and career readiness. For this model, students may be counted only once (i.e., if a student is both college and career ready, they are counted only once toward the target).

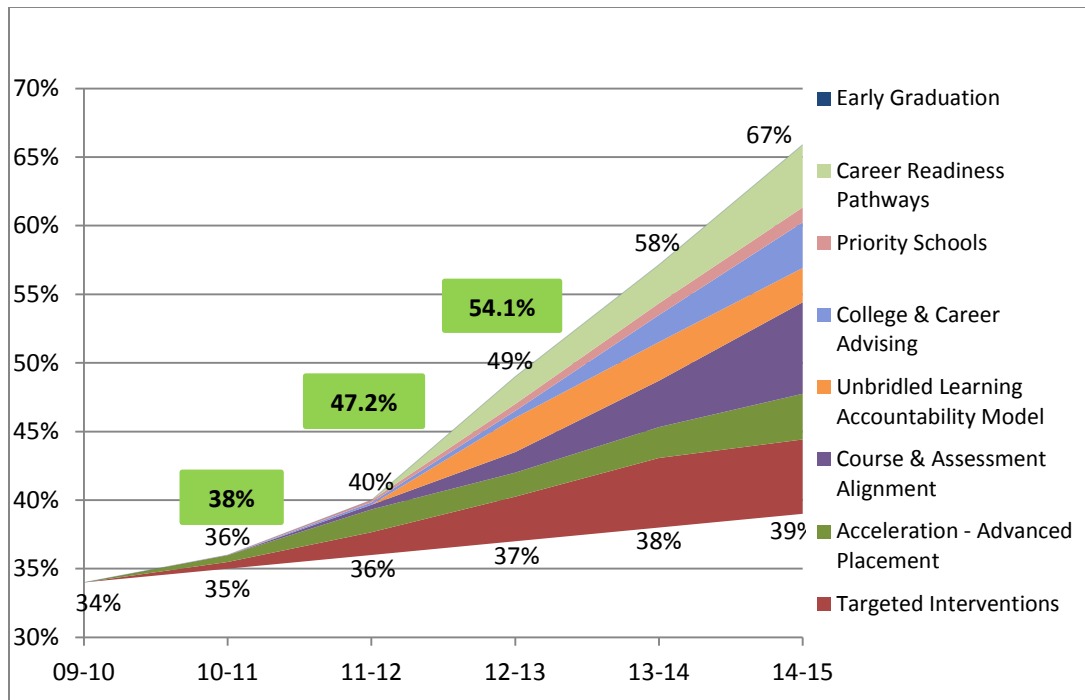


Figure 1. College and Career Readiness Trajectory

As a part of the Commissioner’s Delivery Unit, I used my research training to monitor the CCR plan to determine whether (at any given point in time) Kentucky is on track to meet its CCR goal. When I started in January 2012, the CCR plan had been constructed and was well into its second year. Despite the gains made the first two years of the plan, little was known about strategy-specific impact on student outcomes, no less how students met college (or career ready) outcomes.

At KDE, two widespread assumptions remained uncontested: 1) schools and districts were aware of and implemented the strategies predicted to make an impact on student outcomes, and 2) results implied that the strategies identified in the CCR plan were the appropriate strategies. To support my role of progress monitoring, I use data to deconstruct assumptions to determine whether the CCR strategies are in fact making an impact on student outcomes. In other words, are the CCR strategies together a plan in *action* or in *theory*? Rather than narrowly focusing on the 47.2 percent of students who were CCR in 2011-12 to identify what “worked,” I used student-level data to incorporate into discussion the other 52.8 percent (or roughly 22,700 students) who were neither college nor career ready to determine what didn’t work and why.

Analysis of College Readiness Data

To be considered college ready, students must prove competency in three content areas (i.e., English, reading, and mathematics) by the time they graduate from high school. Figure 2 presents the pathways through which students may become college ready. Kentucky uses the ACT as the primary measure for college readiness, which is administered to all students their junior year.³ Students who pass all three content areas on the state ACT assessment are considered college ready and require no further assessments. If students do not meet all three benchmarks, state legislation requires that they receive an intervention for each content area missed. Upon completion of the intervention, they then take an assessment to prove competency [either the ACT, Compass, or Kentucky Online Testing (KYOTE) assessments], and repeat these steps until successfully meeting all benchmarks.⁴

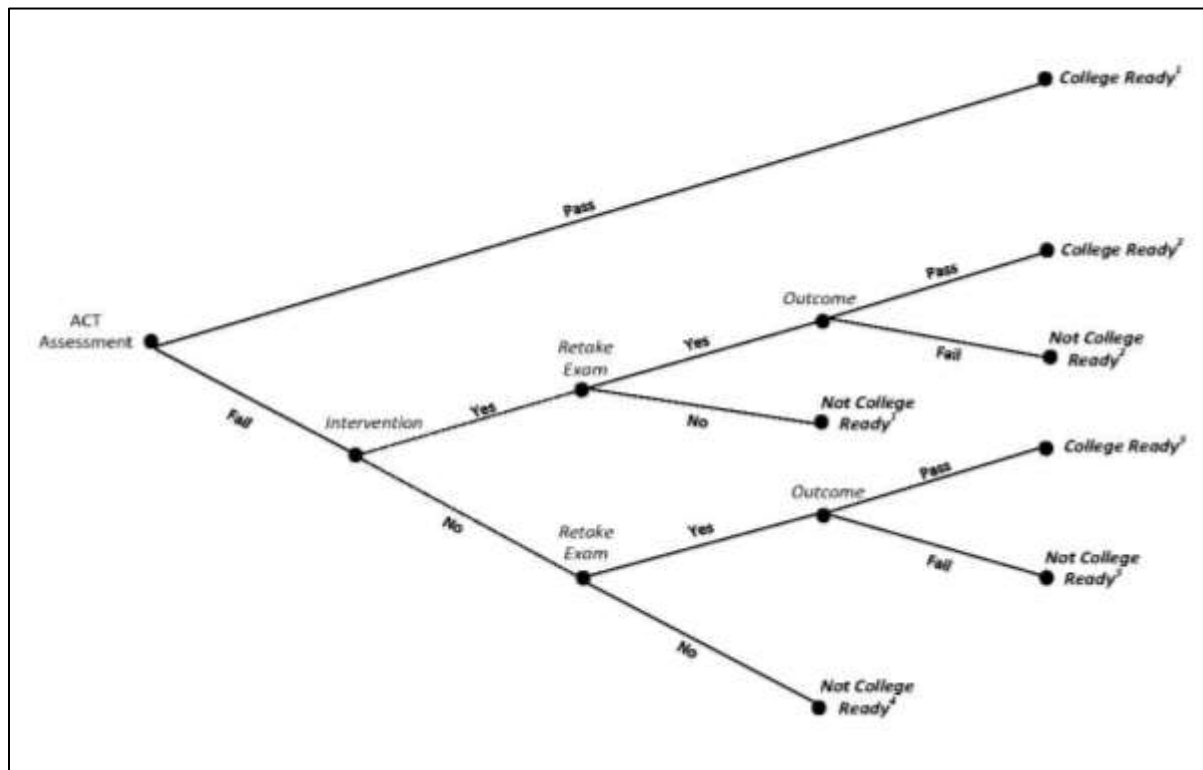


Figure 2. Path Model to College Readiness

³ The ACT benchmarks are 18 in English, 20 in reading, and 19 in mathematics.

⁴ By contrast, to be considered career ready, students must 1) complete a sequence of courses within a defined career pathway and then pass an academic exam (i.e., WorkKeys or ASVAB if they have not already passed the ACT) and technical exam (i.e., industry certification or Kentucky Occupational Skills Standards Assessment). Historically, a greater proportion of the CCR rate is due to college readiness.

USING DATA TO TEST ASSUMPTIONS KDE

At the state level, only college and career outcome data are reported (see School Report Card [here](#)). The data reported mask two very important aspects of the pathway to college readiness (Refer to the dashed lines between *Intervention* and *Retake Exam* on Figure 2). Legislation requires that schools provide interventions to students who score below, but schools are not required to report this information. As a result, KDE does not know whether schools provide interventions to students, no less which interventions work. Without evidence of proving otherwise, it cannot be assumed that all students receive interventions. Second, the data reported do not identify whether students who graduate *Not College Ready* even attempted to retake an exam. The distinction between students who retake an exam and fail to meet all benchmarks (*Not College Ready*² and *Not College Ready*³) from those who do not retake an exam (*Not College Ready*¹ and *Not College Ready*⁴) is necessary to identify compliance with legislation. These data are not reported publicly, but do exist.

Considering the pathways to becoming college ready and the gains made since 2009-10, the data reported leave several unanswered questions that are vital to ensure that KDE reaches its 2014-15 goal: At which point in time do students become college ready? Which college ready benchmark are students more likely to meet (i.e., ACT or CPE)? How many points away from ACT benchmarks were students on their junior year assessment? How many students fail to meet performance benchmarks on the state ACT assessment? What students received interventions?

Every six months, leadership meets with Commissioner Holliday to review progress toward the CCR goal. At this point in time, any unresolved issues are brought to the Commissioner's attention for resolution. Knowing that the CCR targets in the following years were aggressive, I used the May 2013 meeting as an opportunity to introduce these concerns and to discuss how the data may affect or mask strategy-level impact. Using the 2010-11 and 2011-12 student-level data, I began to uncover the process defined in Figure 2 and to identify potential "black boxes" of data collection.

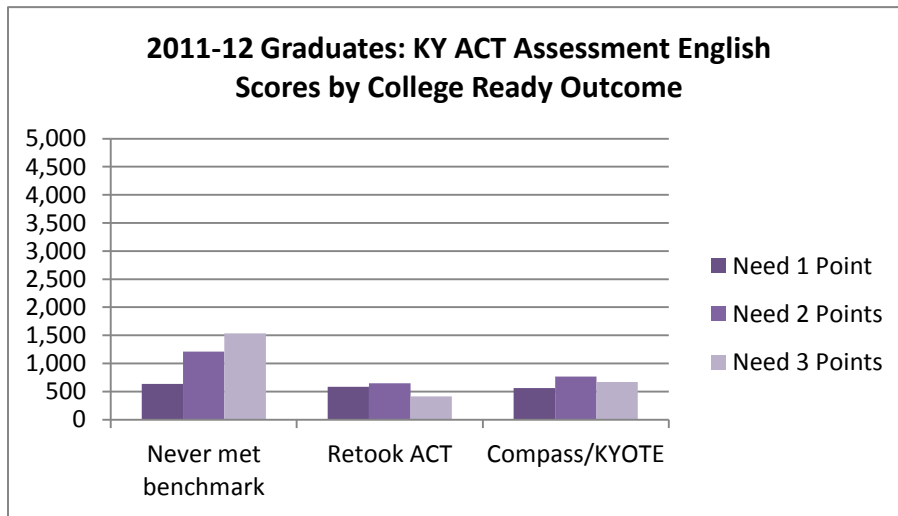
Key Question 1: Through which pathway do students typically become college ready?

In any given year, about 32-35 percent of graduates pass all three content areas on the ACT. Of these students, about 25-27 percent were college ready by the end of their junior year (*College Ready*¹), meaning the remaining students retook the ACT (*College Ready*² or *College*

Ready³). In turn, all other students become college ready by way of meeting benchmarks on the Compass and/or KYOTE assessments (i.e., *College Ready*² or *College Ready*³).⁵

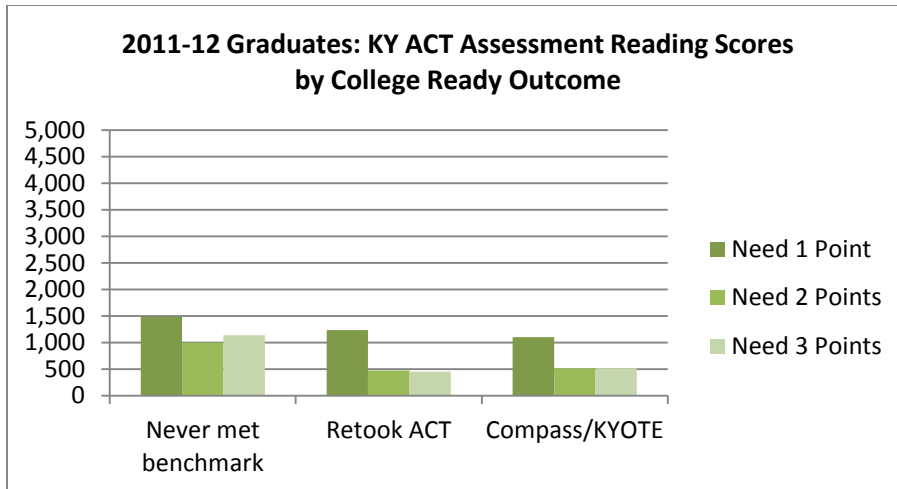
Key Question 2: Considering the 75 percent of 2011-12 graduates who did not meet all three benchmarks on the 2010-11 state ACT assessment, how many were within reach of the benchmarks (i.e., 3 points) and how many met the benchmark before they graduated?

About 7,000 students scored within 3 points of the English benchmark, 9,000 students within the reading benchmark, and 14,400 students within the math benchmark. Of those students, about 50 percent successfully met the English benchmark, 60 percent met the reading benchmark, and 40 percent met the math benchmark (see Figure 3 below).

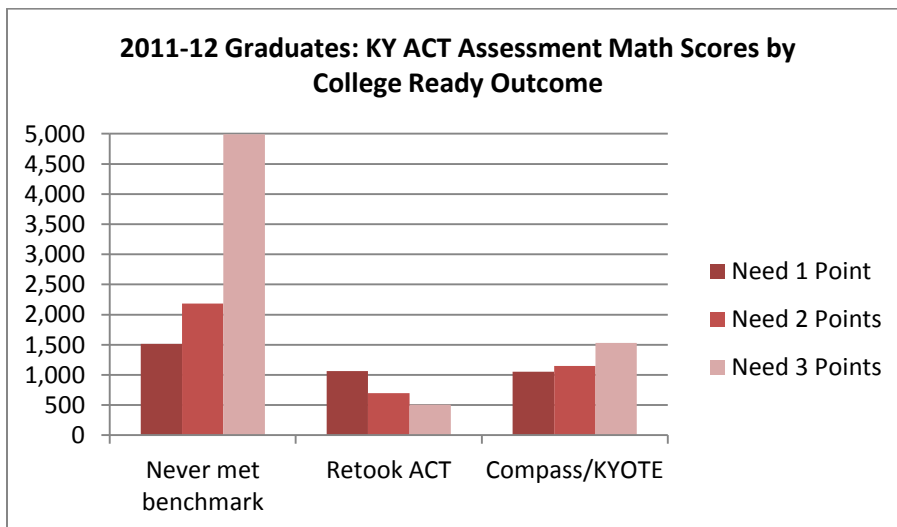


(a) English

⁵ Since the Compass/KYOTE assessments were added to the college readiness calculation in 2010-11, the proportion of students who meet these benchmarks has increased from 2.3 percent to 14.3 percent in 2012-13. The increase is primarily a due to the costs associated with assessments. Students must pay to retake the ACT, while KDE pays for two Compass assessments and the KYOTE test is free.



(b) Reading



(c) Mathematics

Figure 3. College ready outcomes for students who scored within 3 points of the 2010-11 state ACT assessment for (a) English, (b) Reading, and (c) Mathematics.

By law, schools must provide an intervention to all students who fail to meet any performance benchmark. However, the legislation does not require that schools report these interventions in the Kentucky Student Information System (KSIS). The only piece of information reported in KSIS is student enrollment in the KDE offered content-specific targeted intervention courses (one of the CCR strategies, see Figure 1). As a result, KDE does not know what types of interventions students receive, or if they even receive them at all. Given that in any given year,

USING DATA TO TEST ASSUMPTIONS KDE

about 75 percent of all seniors (or about 36,000 students) require at least one intervention, the lack of data is alarming.

Key Question 3: How many 2012-13 seniors were enrolled in an intervention course?

About 10 percent (or 3,000) of seniors were enrolled in an intervention course. A closer examination of enrollment by content area revealed that 1) schools were not using the proper course codes for each content area and 2) students who had already met benchmarks were enrolled in intervention courses.

The next meeting with the Commissioner was scheduled in early October 2013. For this meeting, I revisited the analysis presented to the Commissioner in May and found similar results. I presented one additional piece of evidence, which would later prove very useful when presented to the Kentucky Board of Education (KBE) the following week.

Key Question 4: Of the 20,149 students who graduated in 2012-13 and were neither college nor career ready, how many attempted to take an assessment their senior year?

The findings indicate that about 40 percent of students took an assessment their senior year but did not pass (*Not College Ready*¹ and *Not College Ready*³). Even more concerning, another 25 percent of students did not even attempt to retake an assessment (*Not College Ready*² and *Not College Ready*⁴), which is in violation of state legislation.

In sum, these findings differentiated ways in which students become college ready and the “success rate” of students who are within reach of ACT benchmarks. They also identified mathematics as a major weakness and, for the first time, directed attention to intervention data, identifying it as the most important piece of the puzzle. The findings presented a reason for the Commissioner to be concerned if KDE is to make its future targets, which are a part of his annual evaluation.

Outcomes

Commissioner Holliday responded by directing leadership to present these findings to the KBE at the June 2013 meeting. He used this as an opportunity to increase awareness of the limitations of legislation around interventions and concerns about effective implementation of the math standards across all grade levels. With the support of KBE, the Commissioner called

USING DATA TO TEST ASSUMPTIONS KDE

for two initiatives that will impact students across all grades. I work with both initiatives to provide the research perspective and ensure that proper data are collected.

KDE offers a multitude of programmatic opportunities to schools and districts, but little is known about effectiveness. As the evidence presented in Figure 3 suggests, student performance in mathematics is a concern. The first initiative, which commenced immediately after the June board meeting, is to increase awareness of the Common Core standards for mathematics. A team of content specialists is working to identify all math initiatives, to determine which are aligned to the Common Core standards, and to use assessment data to determine which programs are most effective. The team is also working to develop a communications plan that defines achievement expectations under the umbrella of the definition of college and career readiness. The math initiative workgroup is also collaborating closely with the intervention workgroup to ensure that a common message is communicated to all audiences statewide.

Having set the stage at the June Board meeting, the Commissioner redirected the Board's attention to the inability of KDE to ensure that schools provide students interventions at the August meeting and again in October. Following the August Board meeting, the Commissioner directed a team of intervention specialists and program specialists to develop a tool that collects intervention data in KSIS. The team is working to create a tool that allows schools to enter intervention data and to provide a process through which student performance is monitored. With the ability to match interventions to students, the tool will also allow KDE to identify which noncompliant schools and also identify effective interventions. As a part of this work, the team of KDE experts is collaborating to clearly define what interventions are (not). This definition will be used to construct data standards that will be communicated to schools and districts. The predicted timeline for completion of the tool is January 2014.

Conditions for Success

As KDE prepares to implement its teacher effectiveness system statewide in 2014-15, the work of both initiatives will increase awareness of expectations and opportunities provided to students. The intervention and math initiatives will help uncover what was previously unknown and encourage transparency of accountability. There were several key factors that, without which, these two outcomes would not have been possible:

USING DATA TO TEST ASSUMPTIONS KDE

1. Senate Bill 1 and the Commonwealth Commitment defined the foundational expectations and unified all districts toward achieving the same goal. Without either, the analysis would be only a snapshot of student outcomes with very little leverage to take immediate action.
2. Commissioner Holliday's leadership and direction maintain district commitment to achieve these goals. The Commissioner includes in his annual evaluation progress toward goals defined by each strategic priority. Assuming accountability for all students ensures his commitment to schools and districts as well as program staff at KDE.
3. I used the months preceding the May 2013 meeting with the Commissioner to introduce analysis to program staff and leadership in order to receive feedback and to allow staff to guide the discussion. This decreased staff's resistance to findings and encouraged them to identify and question all assumptions related to student performance and interventions. Without this cultural shift, KDE might not have been able to predict the extent to which CCR rates could have slowed.
4. In June 2013, these results were presented to KBE as a way to elevate the immediate concerns about future attainment. The Commissioner discussed restrictions of current legislation around interventions, which afforded the opportunity for the Commissioner to gain the Board's support of the two initiatives.

In sum, this report highlights an example of how data analysis was used to inform a model of continuous improvement progress monitoring in the Kentucky Department of Education. It is an example of a cultural transition away from using anecdotal evidence as a measure of effectiveness toward a culture of strategic data use to tell a story through comparisons.

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