

Federal Accountability Under ESSA: Value-Added Measure of School Effectiveness Are Related to Student Enrollment and Success in College

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Educational accountability in the nation's public schools—that is, measurement of schools' effectiveness—has gained considerable attention over the last decade, primarily because it has become the basis for sanctioning schools. This is in large part due to the 2001 reauthorization of the federal Elementary and Secondary Education Act (ESEA) known as the No Child Left Behind Act (NCLB), which prescribed how states must develop their educational accountability systems.

Both the Obama administration's Race to the Top grant program and the ESEA Flexibility Waivers enabled a transition from a fairly prescriptive and limited state accountability system to one that offered a new degree of flexibility but required the inclusion of new measures.

Now, the Every Student Succeeds Act (ESSA)—the 2015 reauthorization of ESEA to be implemented in the 2017–18 school year—offers even greater flexibility. ESSA, like NCLB, requires schools to adopt “challenging academic standards,” and preserves NCLB's notion of an accountability framework; however, under ESSA, states have more flexibility in identifying schools for improvement and gives states more latitude to choose certain indicators within it.

States are currently in the process of developing plans under ESSA that include establishing a set of accountability indicators. The law mandates five types of indicators that must be included, one of which is academic achievement based on annual assessments in reading and mathematics in grades 3 through 8 and once in high school. Under ESSA, states must include a measure of student proficiency on the assessments. They also have the option of including a growth measure showing how student performance on the assessments changes from one year to another. Examples of growth measures include student growth percentiles and value-added measures.¹

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The value of a school accountability indicator depends, in part, on whether the indicator measures an attribute that is under a school's control. With respect to performance on assessments, simply reporting, for example, the average proficiency rate of the students in a school—that is, the percentage of a school's students meeting a certain benchmark score on the assessment—is an incomplete measure of school effectiveness.²

In an earlier brief, ACT identified similar drawbacks to other potential accountability measures involving assessment results and found that value-added measures could provide valuable information about growth.³ A value-added measure for a school is based on two or more years of assessment results at the same school for the same students. It is an estimate of the number of score points by which attending that particular school increases students' test scores in a given subject beyond the average expected increase associated with attending a "typical" school.

Because the fundamental purpose of value-added measures is to estimate the influence of schools by controlling for contextual factors such as student socioeconomic status and initial achievement level, such measures provide additional data to help give a more complete picture of the school. As such, one could reasonably expect that a high school's contribution to student learning would extend beyond their high school test scores and would be related to performance after high school.⁴ Therefore, a way of gauging the usefulness of a value-added measure of high school effectiveness is to see how it relates to the college enrollment rate of the school's graduates and their success in college.

If the value-added measure is related statistically to college enrollment, persistence to a second year of college, and first-year college course grades, for example, then it can be a useful component of an accountability system designed to measure schools' effectiveness at holding students to challenging academic standards of the sort required for entry into college.

To test whether value-added measures are related to indicators of college success, ACT analyzed the assessment scores, college enrollment history, and college course grades of students at numerous high schools nationwide who had taken ACT Explore in grade 8 and the ACT test in grade 11 or 12.⁵ The value-added measure for each school represented the school's contribution to students' ACT test scores.

For a portion of the analysis, the students were divided into three groups based on whether their ACT Explore scores indicated that they were below target, on target, or above target to be ready for college-level work by the time they graduate from high school.⁶

The high schools were divided into four categories based on demographic information and the value-added scores for the high schools in the study. Each category reflects both whether the school was high performing or low performing (based on its school effectiveness estimate) and whether its demographics were high poverty and high minority or low poverty and low minority.⁷

Using the students' pre-high school data, we calculated the chances that students in each group and school type would enroll in college and persist to a second year of college at the same or any postsecondary institution. We also predicted the average grades that these students would earn in credit-bearing first-year college coursework in English/language arts, mathematics, natural sciences, and social sciences.⁸

If the value-added measures are related to the indicators of college success, then we would expect students in all three groups at high-performing schools to outperform students in all three groups at low-performing schools—and this is in fact the case. Specifically, in Figure 1, the college enrollment rates (also provided in the first row of Tables A1 and A2 in the Appendix) at both high-poverty, high-minority schools and low-poverty, low-minority schools are consistently higher at high-performing schools than at low-performing schools. For example, at high-poverty, high-minority schools, the college enrollment rate was 80% for above-target students at high-performing schools as compared to 76% for above-target students at low-performing schools.

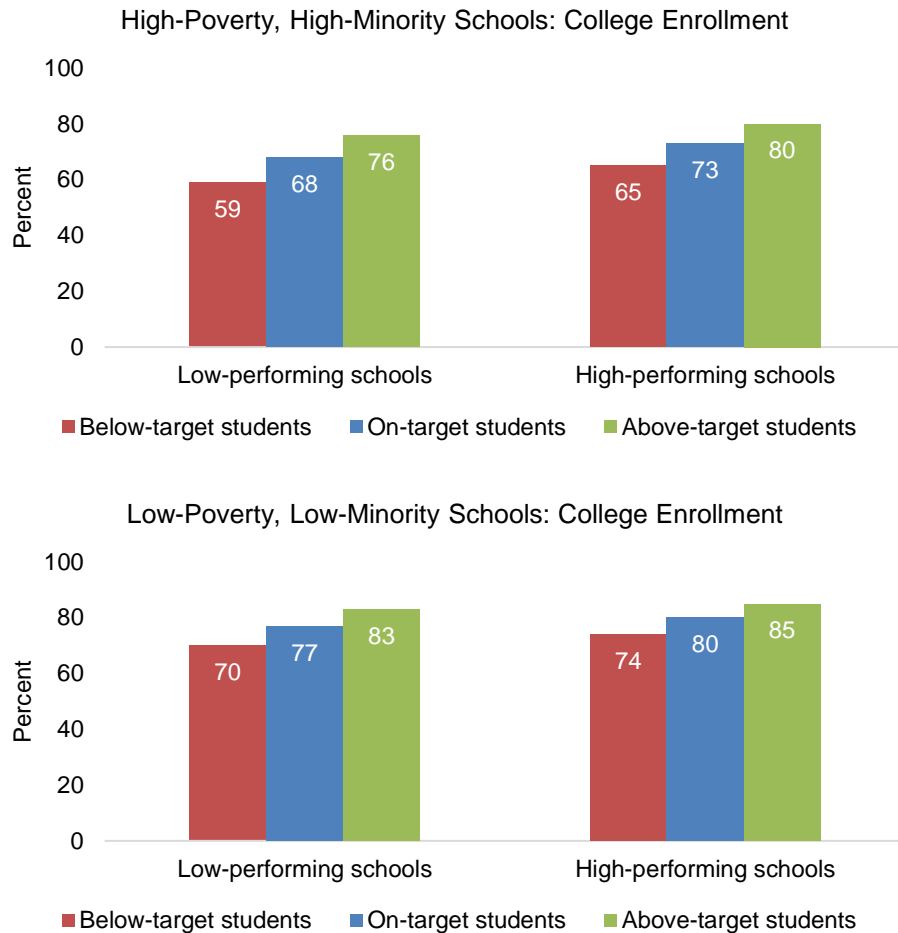
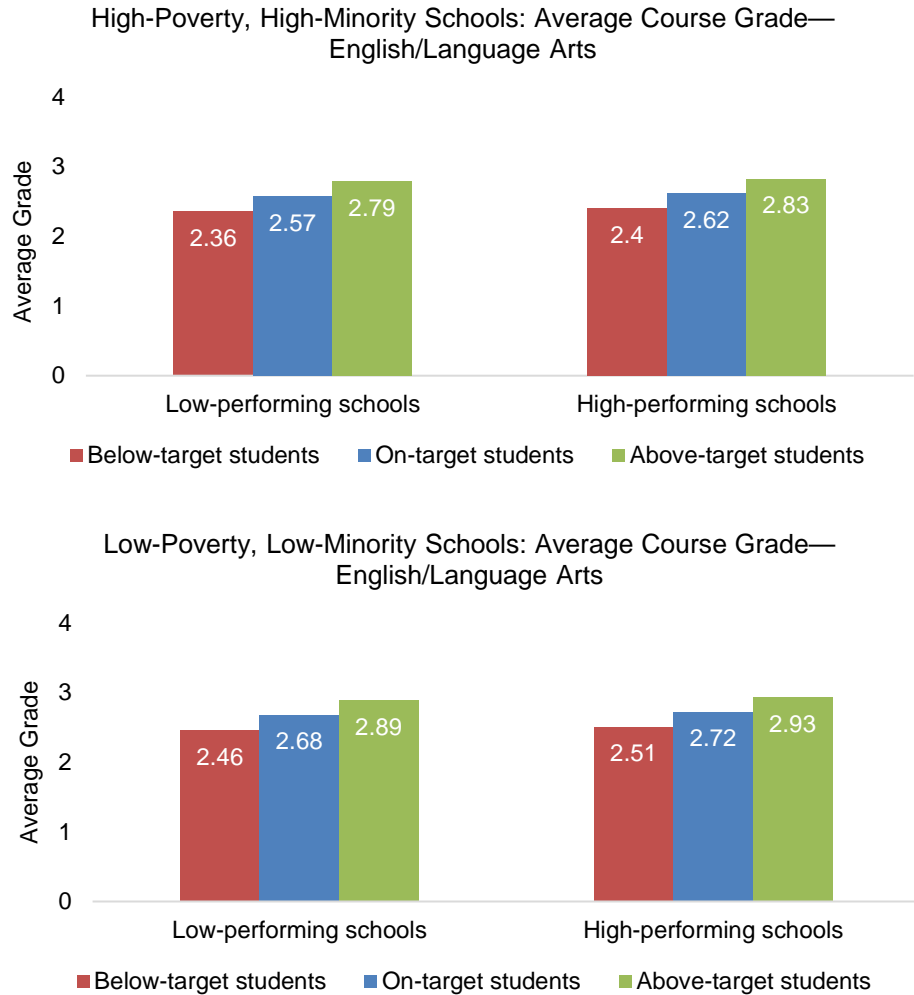


Figure 1. College enrollment rates for students at high-poverty, high-minority schools and low-poverty, low-minority schools, by high school performance level and student achievement level on ACT Explore

The same is true for the persistence rates to a second year of college at the same institution (refer to the second row of Tables A1 and A2 of the Appendix) and at any institution (refer to the third row of Tables A1 and A2 of the Appendix). Further, this relationship is also evident when examining college course grades as the outcome of interest (refer to the remaining rows of Tables A1 and A2 of the Appendix), as exemplified in Figure 2. For example, at high-poverty, high-minority schools, the average English language arts grade was 2.83 for above-target students at high-performing schools as compared to 2.79 for above-target students at low-performing schools.



Note: C+ = 2.17–2.5, B– = 2.51–2.83, B = 2.84–3.16

Figure 2. Average First-year college English/language arts course grades for students at high-poverty, high-minority schools and low-poverty, low-minority schools, by high school performance level and student achievement level on ACT Explore

Additionally, we see that above-target students always outperformed on-target students and the latter always outperformed below-target students for all indicators studied. Although in itself this attests to the utility of the benchmark scores that established the three groups of students, that the

values for each group of students on each indicator are higher at high-performing schools than at low-performing schools represents additional evidence that students from schools with higher value-added scores are more likely to succeed in college.

Summary

ESSA requires states to include student proficiency in their accountability systems, as measured by scores on state assessments. In addition, value-added measures provide data to help give a more complete picture of school effectiveness. ESSA permits, but does not require, value-added measures of student academic achievement.

Recent ACT research⁹ demonstrates that value-added school effectiveness estimates help predict:

- College enrollment
- Persistence to a second year of college
- Grades in first-year college courses in English/language arts, mathematics, natural science, and social science

This research provides evidence supporting the use of value-added measures as markers of schools' effects on college readiness, which in turn makes them further useful as candidates for inclusion in an accountability system. ACT recommends that states include a value-added measure in their accountability systems to better capture the contribution that schools make to student learning and, by extension, to students' success after high school.

Appendix¹⁰

Table A1. College Success Outcomes for High-performing Schools, by Type of High School and Student Achievement Level on ACT Explore

College Success Indicator	High-poverty, high-minority schools			Low-poverty, low-minority schools		
	Below-target students	On-target students	Above-target students	Below-target students	On-target students	Above-target students
Enrollment	65%	73%	80%	74%	80%	85%
Persistence to Year 2 at Same Institution	67%	70%	73%	71%	74%	76%
Persistence to Year 2 at Any Institution	81%	84%	87%	85%	88%	90%
Average English/language arts course grade	2.40	2.62	2.83	2.51	2.72	2.93
Average mathematics course grade	2.08	2.37	2.66	2.22	2.51	2.80
Average natural sciences course grade	2.05	2.35	2.65	2.17	2.47	2.77
Average social sciences course grade	2.07	2.39	2.70	2.23	2.55	2.86

Table A2. College Success Outcomes for Low-performing Schools, by Type of High School and Student Achievement Level on ACT Explore

College Success Indicator	High-poverty, high-minority schools			Low-poverty, low-minority schools		
	Below-target students	On-target students	Above-target students	Below-target students	On-target students	Above-target students
Enrollment	59%	68%	76%	70%	77%	83%
Persistence to Year 2 at Same Institution	66%	69%	71%	70%	73%	75%
Persistence to Year 2 at Any Institution	79%	83%	86%	83%	86%	89%
Average English/language arts course grade	2.36	2.57	2.79	2.46	2.68	2.89
Average mathematics course grade	1.95	2.24	2.53	2.09	2.38	2.66
Average natural sciences course grade	1.96	2.26	2.56	2.09	2.39	2.69
Average social sciences course grade	1.97	2.29	2.60	2.13	2.45	2.76

Notes

¹ Castellano, K. E., & Ho, A. D. (2013). *A practitioner's guide to growth models*. Washington, DC: Council of Chief State School Officers (CCSSO).

² See, for example, Howley, C., Strange, M., & Bickel, R. (2000). *Research about school size and school performance in impoverished communities*. Charleston, WV: ERIC Clearinghouse on Rural Education and Small Schools.; Linn, R. L. (2001). *The design and evaluation of educational assessment and accountability systems*. Los Angeles, CA: Center for Research and Evaluation, Standards, and Student Testing.

³ ACT (2009). *Using ACT data as part of a state accountability system*. Iowa City, IA: ACT.

⁴ In a similar vein, research has demonstrated the value added by teachers in grades 4–8 to later student outcomes, including some indicators of success in college. See Chetty, R., Friedman, J. N., & Rockoff, J. E. (2011). *The long-term impacts of teachers: Teacher value-added and student outcomes in adulthood*. Cambridge, MA: National Bureau of Economic Research.

⁵ Bassiri, D. (2016). *Are value-added measures of high school effectiveness related to students' enrollment and success in college?* Iowa City, IA: ACT. The study was based on test-score data from more than 263,000 students who graduated in 2004 through 2009 from 1,119 high schools across the United States. First-year college course grade data were collected across multiple years from postsecondary institutions participating in ACT's Course Placement Service (CPS) or ACT's Prediction Service, yielding, college course grade data for 26,863 students.

⁶ One of the uses of scores on ACT Explore, a test retired by ACT in 2014, was to indicate whether students were on target to be ready for credit-bearing college coursework by the time they graduated from high school. The ACT Explore Benchmark in a given subject was the minimum score on the corresponding ACT Explore subject test indicating that the student was on target to have a 50 percent chance of earning a B, or roughly a 75 percent chance of earning a C, in credit-bearing first-year introductory college courses in that subject.

The study under discussion used each of the subject-specific ACT Explore Benchmarks—English (13) for English/language arts, Mathematics (17) for mathematics, Reading (16) for social sciences, and Science (18) for natural sciences—to examine course-grade outcomes, and a composite of the four Benchmarks to examine outcomes for enrollment and persistence.

The study defined “below track” as scoring at least two points below the ACT Explore composite Benchmark, “on track” as meeting the composite benchmark, and “above track” as scoring at least two points above the composite benchmark; for greater clarity, the main text of this brief uses “target” rather than “track.”

⁷ The categories were defined as follows: High-performing schools had an overall school effect estimate one standard deviation above the mean; low-performing schools had an overall school effect estimate one standard deviation below the mean; high-poverty, high-minority schools had both 75 percent of students eligible for free or reduced-price lunch and a 75 percent concentration of racial/ethnic minority students; for low-poverty, low-minority schools, these figures were both 25 percent.

⁸ All values in Tables A1 and A2 were adjusted to control for students' prior level of academic achievement in English, mathematics, reading, or science; the number of months between ACT Explore and ACT testing; student demographic characteristics (gender, race/ethnicity); and five school characteristics: size, proportion of students tested, poverty level, proportion of racial/ethnic minority students, and mean ACT Explore score.

⁹ Bassiri (2016), *Value-Added Measures of High School Effectiveness*.

¹⁰ The estimated values reported in Tables A1 and A2 are taken from Tables 11 and 12, respectively, in Bassiri (2016), *Value-Added Measures of High School Effectiveness*.