



# REPORT

OCTOBER 2019



## THE MISSOURI ANNUAL PERFORMANCE REPORTS

*By Susan Pendergrass*

### KEY FINDINGS:

- The Missouri Department of Elementary and Secondary Education (DESE) uses a school performance reporting system (Annual Performance Reports, or APRs) that leads to almost no variation in results across districts or schools.
- The APRs are based on five indicators, and the scoring for each of the indicators contains so many opportunities for “extra credit” that the results do not reflect actual performance.
- The data on which each of the APR indicators is based are not strongly correlated to the points earned on each indicator.
- DESE should craft a school performance reporting system that provides useful and relevant information for stakeholders.

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## INTRODUCTION

To assess the academic performance of public schools and public school districts, the Missouri Department of Elementary and Secondary Education (DESE) uses the Missouri School Improvement Plan (MSIP), which generates point-based Annual Performance Reports (APRs) for each public school and public school district in the state. The APRs report on the percentage of points that each school or school district earned out of their maximum possible points, which varies.<sup>1</sup> At the district level, the percentage of points is compared to a threshold to determine if the public school district should be given a label of “Fully Accredited,” “Partially Accredited,” or “Unaccredited.” Although individual Missouri schools are not given a label that indicates whether or not they are accredited, they are rated according to the same APR point system used for districts.<sup>2</sup>

## APR RESULTS

Although 512 out of 518 public school districts earned sufficient APR points to put them in the “Fully Accredited” category in 2016–17, there was variation in APR scores.<sup>3</sup> Map 1 shows the distribution of APR scores across the state.

Looking at the same data, but at the school level, also shows variation (Map 2). Nonetheless, much of the state is blue, meaning they would have met the district-level threshold for Fully Accredited.

Converting the public school APR scores to letter grades (A+ = 100 percent, A = 90 percent through 99.9 percent, B = 80 percent through 89.9 percent, C = 70 percent through 69.9 percent, D = 60 percent through 59.9 percent, and F = less than 60 percent) results in the distribution shown in Figure 1.

<sup>1</sup> On October 17, 2019, DESE released the 2018–2019 APRs with a new format. While the calculation of APR points is still available upon request, the calculations are no longer included in the APRs

<sup>2</sup> Schools with a highest grade below grade 3 are only rated on attendance, with a maximum of 10 points. Schools that terminate below grade 8 are scored on academic performance (including growth), super-subgroup academic performance, and attendance. Schools with grade 8 but not grade 12 are scored on those three categories plus a measure of high school readiness. And high schools are scored on academic performance (without growth), super-subgroup academic performance (without growth), college/career readiness, attendance, and graduation rates.

<sup>3</sup> This analysis uses 2016–17 APR scores because the 2017–18 APR scores for high schools were not able to include academic performance or subgroup performance due to errors in the administration of the test.

Nearly 60 percent of the 2,084 schools with scores would have received A+’s or A’s. Approximately 10 percent would have received a D or an F. Again, DESE does not give letter grades or labels, such as accreditation to schools, but they are a metric that is easily understood by most stakeholders in public education.

Breaking these out by grade level, the scoring criteria seem to be pushing high school-level scores upward. This is partially due to the fact that over 20 percent of a high school APR score is from graduation rates and 485 out of the 517 high schools with graduation points, or 94 percent, received the full 30 points in 2016–17. In addition, 226 received the full 10 points for attendance. College and career readiness, on the other hand, had fewer than 200 schools receiving the full 30 points, an anomaly that will be discussed more later.

For schools that end at grade 8, the distribution is much more even. In fact, less than 30 percent of these schools received the full points for academic performance and just under 7 percent received the full points for subgroup academic performance. It would be interesting to see how the scores of high schools compare to those of their feeder schools. Lower-scoring middle schools feeding into high-performing high schools could potentially be an artifact of an overly generous high school scoring system.

## HOW WELL DOES THE APR SYSTEM REFLECT SCHOOL PERFORMANCE?

So there is a problem: If school performance varies but MSIP ratings do not, then MSIP is not capturing school performance. How can this be? Answering that question requires examining the factors that make up a school or district’s APR score and understanding which elements are driving the score.

The Missouri APR system is designed so that schools and districts receive points across five indicators:

- Academic achievement
- Subgroup academic achievement
- College and career readiness (or high school readiness)
- Attendance
- Graduation rates

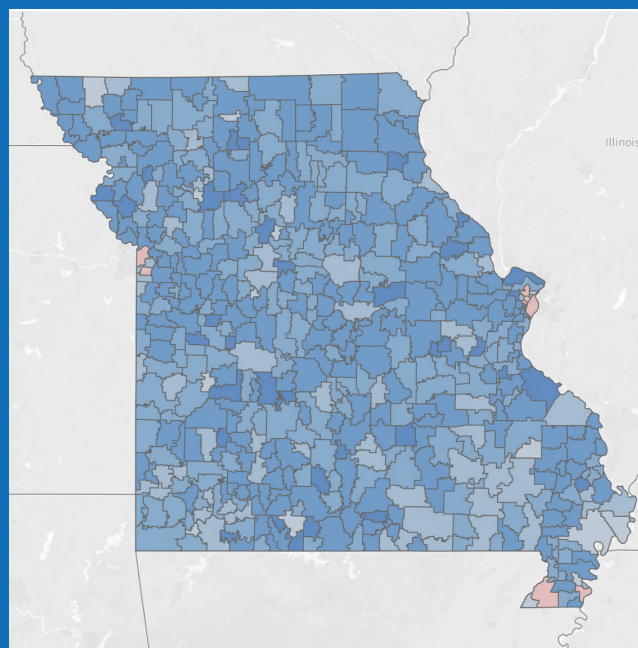
Points can be earned for both status (the performance of a school or district in a given year) and progress (improvement in performance). Across all categories, the progress points are treated as “extra credit” for the purpose of the APR score. For example, a school can earn up to 10 points for attendance and another 7.5 points for progress, which depends on how much attendance has improved from prior years. However, even if the maximum (17.5) points are earned, the total points possible is only 10. The progress points are considered extra credit, and are therefore in the numerator but not the denominator, when calculating the percentage. All schools that earned between 10 and 17.5 points would be considered to have earned 100 percent of the possible points. Progress is assessed by comparing the 2-year average of the indicator for the current year and the prior year to the 2-year average of the prior year and the year before that. Two-year averages are presumably used to smooth the data and reduce random error.

For the two academic achievement indicators (all students and the subgroup), additional points can also be earned for growth. The growth measure is calculated via a value-added model that predicts each student’s test score based on their prior year’s score. The difference between the actual score and the predicted score residual is then compared to the average district or school residual to determine how much growth a school has generated in that student. All growth model results are then fitted to a mean of 50 and schools that have a score that is significantly higher than 50 or not statistically different than 50 receive extra points, while those with growth results that are statistically significantly below 50 do not. For the two academic indicators, schools can earn either progress or growth points, whichever is higher. Either way, the points are again in the numerator, but not in the denominator, when calculating the percentage of points earned. Also, it should be noted that the growth scores are only calculated for 4th through 8th grade.

The academic indicators are scored using either a MAP Performance Index (MPI) or a Normal Curve Equivalent (NCE). MPI is simply a weighted average of the number of students in each achievement category (Below Basic, Basic, Proficient and Advanced). Each category has a point value. Below Basic = 1, Basic = 3, Proficient = 4, and Advanced = 5. The number of students in each category is multiplied by the point values and the total is

Map 1:

## Total District Level APR Percentage Points Earned: 2016–2017



Source: MSIP-5 District/Charter APR Summary Report—Public Historical, Missouri Department of Elementary and Secondary Education, Districts, Charters, & Schools. [apps.dese.mo.gov/MCDS/home.aspx](https://apps.dese.mo.gov/MCDS/home.aspx).

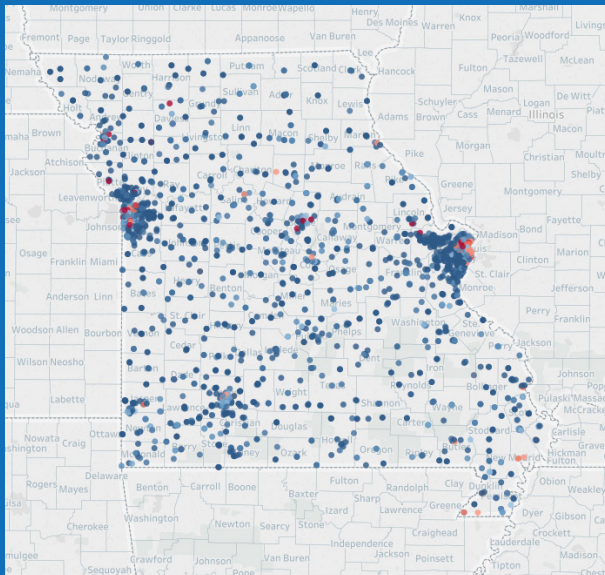
divided by the number of students—making it a weighted average. That number is then multiplied by 100 to create an MPI score. Thus, an MPI of 361 is really just a school with a weighted average of 3.61 on the 1, 3, 4, 5 scale, or somewhere between Basic and Proficient.

An NCE normalizes data, based on the normal curve (or standard bell curve) and converts each number based on its distance from the mean. NCEs are useful for comparing measures with different underlying metrics, such as dollars and rates of proficiency. They are also helpful, in the case of Missouri, to compare test score data when the testing instrument changes from year to year. For the 2016–17 Missouri data, rates of proficiency, MPIs, and NCEs were strongly correlated. Thus, the analysis here uses rates of proficiency, as it is the easiest measure to interpret.



## Map 2: Total School-level APR Percentage Points Earned: 2016–17

Schools that earned at least 60 percent of their possible APR points are shown in blue; those that did not are shown in red.



Source: MSIP-5 District/Charter APR Summary Report—Public Historical, Missouri Department of Elementary and Secondary Education, Districts, Charters, & Schools. [apps.dese.mo.gov/MCDS/home.aspx](https://apps.dese.mo.gov/MCDS/home.aspx).

The College and Career Readiness (CCR) indicator is a combination of high school graduates' scores on assessments for their next step (ACT, SAT, COMPASS, ASVAB, and Workkeys exams), student attainment of postsecondary credit while in high school (Advanced Placement [AP], International Baccalaureate [IB], dual enrollment, and Technical Skills Attainment [TSA] or Industry Recognized Credential [IRC]), and student postsecondary placement (college, military or a job in their field if they were a career/technical education student). Each of these is expressed as a percentage of graduates who met the standard, and each has points for both status and progress.

Elementary and middle schools that offer high school level coursework such as Algebra I to 8th-graders receive High School Readiness (HSR) points under the CCR indicator. These points are based on the percentage of 8th-graders who received a score of Proficient or Advanced on a 9th-grade end-of-course (EOC) exam, with a target of 50 percent of students receiving such a score. The difference between 50 percent and the percentage of 8th-graders in a school who met the standard is called a "gap," and the indicator is scored based on the gap.

The attendance indicator measures the percentage of students who attended at least 90 percent of the total hours in the school year. However, students who miss this threshold may be counted as a half (.50) of a full-time equivalent (FTE) student if they attended 87.5 percent of the hours and as a quarter (.25) of an FTE student if they attended for 85 percent of the hours.

Finally, there is a graduation rate indicator for high schools. Graduation rates are calculated for an adjusted 9th-grade cohort for four years, five years, six years, and seven years. Schools are assessed based on the highest rate for those four time periods.

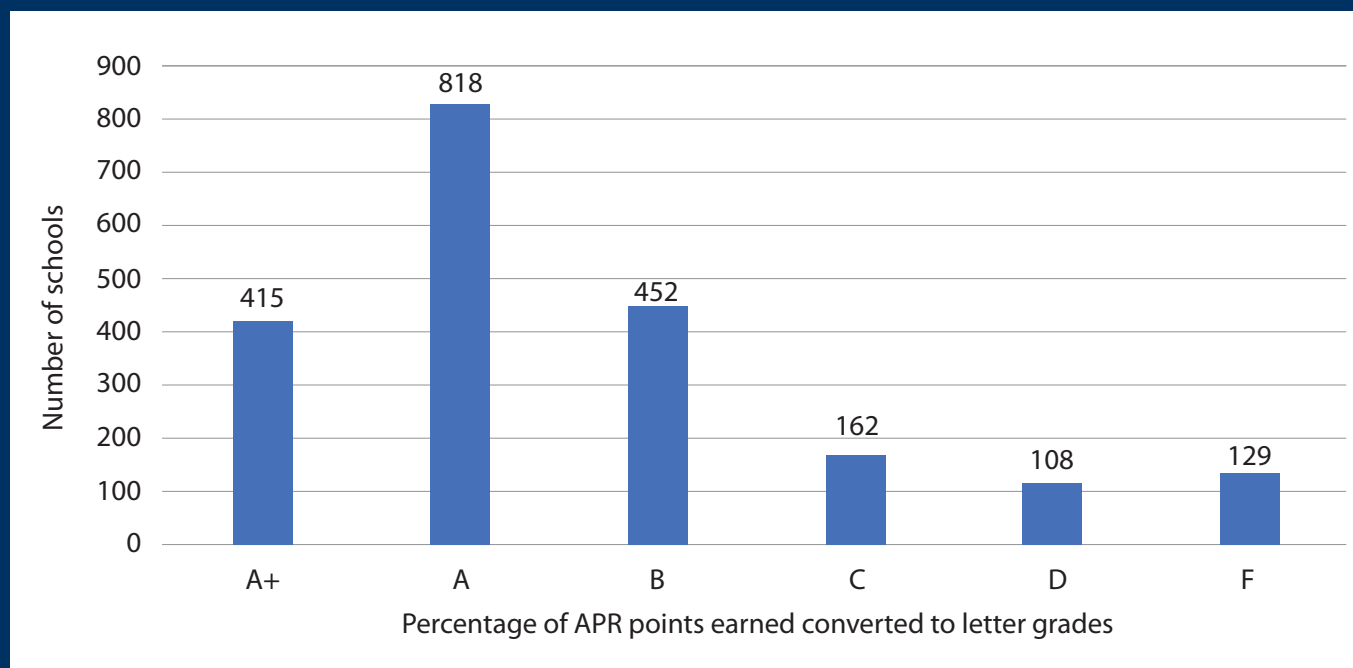
Given the complexity of these indicators, it's useful to compare the points received to the underlying measure to determine if they are a good reflection of the item being measured. The data that were used to calculate 2016–17 APR scores are available from DESE. These were used to calculate correlation coefficients, which are measures of how closely two sets of numbers are associated. Correlation coefficients range from  $-1$  to  $+1$ , with numbers close to  $-1$  indicating that sets of numbers move in the opposite direction and numbers close to  $+1$  indicating that sets of numbers move in the same direction. Table 1 contains correlation coefficients for the various components of the APR score to their underlying data for each school. Each variable of the underlying data is only correlated with the associated indicator. In other words, the graduation points indicator is only correlated with the four graduation rates.

The academic achievement indicator has the most points possible and therefore is, not surprisingly, the most positively correlated with the percentage of APR points received by the school. However, the academic

Figure 1:

**Total School-level APR Percentage Points Earned: 2016–17**

Schools that earned at least 60 percent of their possible APR points are shown in blue; those that did not are shown in red.



Source: MSIP5 District/Charter APR Supporting Data Report – Public, [https://apps.dese.mo.gov/MCDS/Reports/SSRS\\_Print.aspx](https://apps.dese.mo.gov/MCDS/Reports/SSRS_Print.aspx).

achievement points are only correlated by 0.58 with Communication Arts (Reading) proficiency scores and 0.54 with Math proficiency scores. (Correlation coefficients between 0.7 and 1.0 indicate strong positive relationships). The relationship between subgroup academic performance (as measured by proficiency rates) and the subgroup academic achievement indicator points is even weaker, at 0.46 for both subjects. This means that high points in these two APR categories may not reflect high rates of proficiency or low achievement gaps.

Interestingly, the growth NCE of each school is seemingly unrelated to APR academic achievement points received. This could be partially due to the need to use the 2018 growth data, as the 2017 data were not available. Nonetheless, this is interesting because, while the debate as to whether growth or proficiency is more important is far from settled, the Missouri accountability system reflects

essentially no information on the amount of growth that schools are or are not achieving in their students.

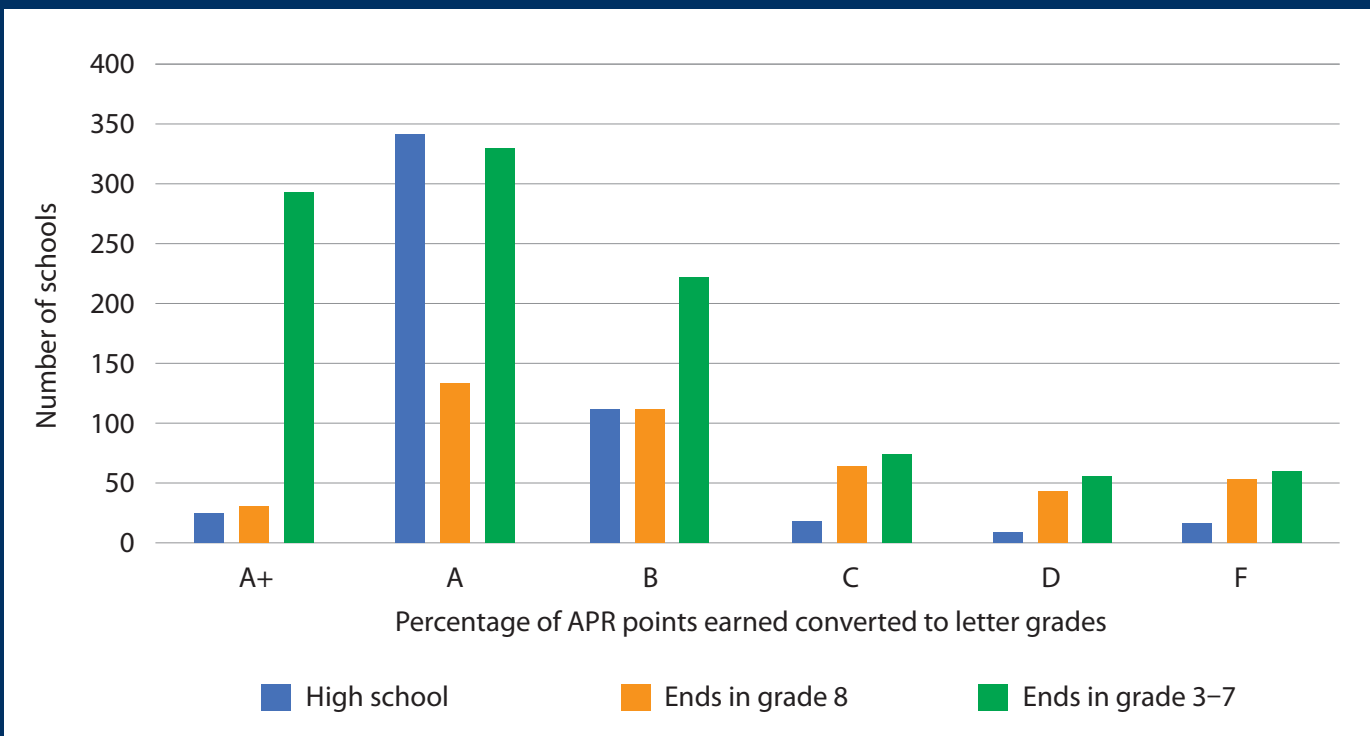
Of the categories of college and career readiness, the scores on postsecondary placement assessments were most positively correlated with the points given in the CCR category. The high school readiness points given do not seem to provide much information on the percentage of high school coursework passed by 8th-graders, with a correlation coefficient of just 0.27.

The attendance APR points received corresponds fairly closely to actual attendance percentages. And, regardless of which year is used, the graduation rates of schools are related to the APR graduation points received, but not strongly. This is unfortunate, given the high weight of graduation points in high school APR scores.

Figure 2:

## Missouri public schools by APR percentage points earned by grade level, converted to letter grades: 2016–17

Nearly every high school in Missouri received at least 90 percent of their possible APR points in 2016–17.



Source: MSIP5 District/Charter APR Supporting Data Report – Public, [https://apps.dese.mo.gov/MCDS/Reports/SSRS\\_Print.aspx](https://apps.dese.mo.gov/MCDS/Reports/SSRS_Print.aspx).

Why doesn't the APR system correspond to school performance? The use of extra credit points, grading on a curve in several indicators, and a complicated but not-very-useful growth measure render the results of the system almost meaningless. One important but seemingly unaddressed issue is achievement gaps. If the performance of disadvantaged students is simply papered over by the performance of non-disadvantaged students, then it's impossible to say which districts are meeting the challenge of adequately educating all students.

## CONCLUSION

One of the main tasks of a state education agency is to collect data on school performance and report it to the public. While DESE technically completes this task, the reported results don't reflect actual school performance. The data that are collected may or may not have value, but they should be used to create indicators that have meaning.

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Table 1:

**Correlation Between APR Points and Underlying Performance Data: 2017**

	Percentage of APR points received	Academic achievement points	Subgroup academic achievement points	College and career readiness points	High school readiness points	Attendance points	Graduation points
Percentage of APR points received	1.000	0.711	0.488	0.581		0.297	0.469
2017 Comm Arts percent proficient or above	0.683	0.581					
2017 Math percent proficient or above	0.711	0.542					
2017 Comm Arts percent proficient or above - subgroup	0.593		0.456				
2017 Math percent proficient or above - subgroup	0.615		0.459				
2018 Comm arts growth NCE	0.126	0.053					
2018 Math growth NCE	0.192	0.104					
2017 CCR: SAT, ACT, Compass, ASVAB, Workkeys	0.570			0.692			
2017 CCR: AP, IB, TSA, dual credit	0.438			0.503			
2017 CCR: Postsecondary placement	0.285			0.390			
2017 HSR: percent with qualifying score	0.359				0.271		
2017 Percent attend	0.424					0.650	
2017 4-yr graduation rate	0.496						0.445
2017 5-yr graduation rate	0.426						0.431
2017 6-yr graduation rate	0.357						0.501
2017 7-yr graduation rate	0.339						0.530

Source: District content area and grade all and disag 2018, <https://apps.dese.mo.gov/MCDS/home.aspx>



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