

# Achievement Exceeding Predicted Proficiency

## *Methodology*

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- **Goal:** Achievement Exceeding Predicted Proficiency (AEPP) is designed to compare student proficiency on standardized tests at the school level, across grades, and over time, controlling for socioeconomic status.
- **Advantages:** AEPP uses a multiyear approach that helps to level out volatility that may be present in a given year; builds on work by others; uses publicly available data sets; offers a complete school and district-level analysis; and employs a basic methodology that is easily replicable.
- **Disadvantages:** It includes any disadvantages of the standardized tests and does not incorporate other factors that can affect performance, such as cultural differences, pre–K education, and neighborhood factors.<sup>1</sup>

Many methods can be used to conduct this type of analysis. The goal here is to provide one view of the data so that schools and districts can compare their actual performance to predicted performance, based on the socioeconomic status of their students.

### ACHIEVEMENT EXCEEDING PREDICTED PROFICIENCY (AEPP)

In order to accomplish the stated goal, state standardized tests were used from grade 11 (see table below), as recent changes to standardized testing in Michigan make three-year averages of all other grades impossible at this time. Three years of data were included in the overall AEPP ranking to allow a broader view of school performance and account for variations from year to year. The focus was on the number of students within a school who were deemed “proficient” in a given subject. As such, the *percent proficient* was utilized, as opposed to the average test scores for the district (which give no indication of how many/what percentage of students have met the proficiency standard). All test data were available through the Michigan Department of Education (MDE).<sup>2</sup>

State Standardized Tests, 2012–2015

	Grade	Test	Subject	Test date
High School	Eleventh <sup>a</sup>	ACT	Math	Spring 2012–2015
	Eleventh <sup>a</sup>	ACT	Reading	Spring 2012–2015
	Eleventh <sup>a</sup>	ACT	Science	Spring 2012–2015
	Eleventh <sup>a</sup>	ACT	English	Spring 2012–2015

<sup>a</sup> The ACT can also be taken in the 10<sup>th</sup> or 12<sup>th</sup> grade.

<sup>1</sup> Anja Kurki, Andrea Boyle, and Daniel Aladjem. 2005. *Beyond Free Lunch—Alternative Poverty Measures in Educational Research and Program Evaluation*. American Institutes for Research, Washington, D.C.

<sup>2</sup> Tables used: 2012–2015 ACT Proficiency Data File. Available at:

<https://www.mischooldata.org/DistrictSchoolProfiles/EntitySummary/SchoolDataFile.aspx>; 2012–2015 Free and Reduced Lunch Counts. Available at:

<https://www.mischooldata.org/Other/DataFiles/StudentCounts/HistoricalFreeAndReducedLunchCounts.aspx>

Based on the available data and the review of peer-reviewed literature, this analysis utilizes the percentage of students eligible for free or reduced price lunch as the socioeconomic indicator and utilizes an ordinary least squares (OLS) regression analysis to predict the percentage of students projected to be proficient for a particular grade/test. The AEPP is in part based on previous work by the University of Arkansas, in which the actual performance of a school on a particular test in a particular grade is compared to its projected performance, given the socioeconomic status of the school or community.<sup>3</sup> The total number of free and reduced priced lunch students is variable most often used by researchers, particularly those relying on secondary data, as an indicator of student socioeconomic status.<sup>4, 5, 6, 7</sup> Similar to a Mackinac Center study, the socioeconomic indicator of a school (using free and reduced priced lunch, in this case) was the only independent variable in the regression analysis.<sup>8</sup> The socioeconomic indicator is as follows:

$$\frac{\text{Number of students Eligible for Free OR Reduced Priced Lunch}}{\text{Total number of students}} * 100$$

Following this formula, schools in which all students are eligible for free or reduced priced lunch would have a socioeconomic indicator score of 100 and a district in which no students are eligible for either free or reduced price lunch would have a socioeconomic indicator score of 0.

The percent proficient also was adjusted for each district/grade/test by the statewide mean and standard deviation for the given grade/test, to normalize the distributions to a mean of 100 and a standard deviation of 15.

$$\text{Adjusted Percent Proficient} = 100 + 15 \left( \frac{\text{Percent Proficient} - \text{Calculated State Mean}}{\text{Calculated State Standard Deviation}} \right)$$

The calculated state mean and calculated state standard deviation used for each test were calculated based on all available percent proficiencies reported for the given test. All schools, including those with incomplete data, were used in this calculation. This adjusted percent proficiency (APP) was then utilized as the dependent variable in the OLS regression, using the socioeconomic indicator of free and reduced price lunch as the independent variable to predict the projected percent proficient (PPP). A district's APP is then compared to the PPP and adjusted so that a school that performs exactly as projected would score a building level year X–AEPP of 100.

$$\text{Year X} - \text{AEPP} = \frac{\text{APP}}{\text{PPP}} * 100$$

If a school performs above its projected level, its year X–AEPP would be above 100, and if it performs below its projected level, its year X–AEPP would be below 100. This does not mean that schools with a AEPP below 100 have a low percentage of students meeting the proficiency standards. What it does mean

<sup>3</sup> Jay P. Greene, et al. 2006. *The School Performance Index in Arkansas*, Department of Education Reform. University of Arkansas. Available at: [www.uark.edu/ua/der/Research/SPI/SPI\\_Full\\_Document.pdf](http://www.uark.edu/ua/der/Research/SPI/SPI_Full_Document.pdf) (accessed January 20, 2013).

<sup>4</sup> The Center for Educational Performance and Information (CEPI). Fall 2011. District-Level Free and Reduced-Price Lunch Counts.

<sup>5</sup> Bruce D. Baker. July 18, 2013. *A Poverty of Thinking about Poverty Measures in New Jersey School Finance*. New Jersey Education Policy Forum. Rutgers University Graduate School of Education.

<sup>6</sup> Kurki, Boyle, and Aladjem. 2005.

<sup>7</sup> Selcuk R. Sirin. 2005. Socioeconomic Status and Academic Achievement: A Meta-Analytic Review of Research, *Review of Educational Research*. Fall 2005. Vol 75:3, p. 417–453.

<sup>8</sup> Michael Van Beek, et al. 2012. *The Michigan Public High School Context and Performance Report Card*. The Mackinac Center for Public Policy. Available at: [www.mackinac.org/17256](http://www.mackinac.org/17256) (accessed December, 15 2012).

is that relative to how well the students are *projected* to perform, given the socioeconomic status of the student population, the district's students are not meeting expectations. For example, if 90 percent of a school's students are proficient on all tests, but the district is projected to have 95 percent of students proficient on all tests, the school's AEPP would be 94.74. Obviously, this school would be considered very successful based on the standard performance measures, but once socioeconomics are taken into account, it is underperforming compared to expectations.

The year AEPPs for high school are a composite of test scores. A year X–AEPP is first calculated for the grade level (grade 11 year X–AEPP, for this year's ACT-only AEPP). The three-year AEPP for high school is an average of the most recent three years of available data, from fall 2012 to spring 2015.

$$3 \text{ Year AEPP} = (AEPP 2013 + AEPP 2012 + AEPP 2011)/3$$

A school will only have a high school AEPP if it has scores reported for the targeted grade. For example, only those schools that reported scores for the 2014–2015 school year in the targeted grade (11) have a high school AEPP for 2015. Schools with fewer than a full complement of test scores were utilized in the calculations to determine AEPP scores and may have individual year AEPPs, but were not included in any rankings.

Only schools that have a full three years of data reported are included in the three-year AEPPs. While this may exclude a few newer schools, overall it excluded relatively few schools. Their tests scores were used in the analysis, but they are not included in the overall rankings. Again, the rationale for excluding these schools is to avoid unequal comparisons between established and emerging schools.

The AEPP allows for a comparison of schools in Michigan while controlling for a key driver of student success—socioeconomic status. Several highly ranked schools are very low-income schools that appear to perform poorly when looking only at the percentage of students found proficient. These schools may, in fact, be over-performing in terms of how we would expect them to perform given their socioeconomic status. The AEPP allows us to view each district relative to *itself*, so schools can see how they are internally performing, given what is projected.

This is only one model of projected performance out of many and is intended to begin an open dialogue on how we view school and student performance.