

Estimating the Additional Cost of Providing an Adequate Education

One of the traditional principles in school finance which has guided Regents Proposal development in past years has been a wealth and need equalization principle. This principle was designed to drive greater amounts of aid per pupil to school districts with limited fiscal capacity and high concentrations of pupils in need. The focus of school finance, particularly in New York State, has shifted from equity to the provision of an adequate education¹. By the term adequate education is meant the greater equalization of academic outcomes (not resource inputs) so that all children are provided the opportunity to receive an education, which will subsequently allow them to lead meaningful and productive adult lives.

Purpose

The purpose of this report is to describe the methodology that was used to estimate the likely additional expenditures needed by districts with lower academic performance to achieve educational outcomes that demonstrate that an adequate education is being provided.

Methodology

The Empirical Approach: Empirical estimates of the cost of an adequate education typically begin by identifying districts that are already achieving a desired state of academic performance. The most straightforward application of the empirical method starts with an examination of the spending patterns among all such districts to determine the average expenditure per pupil of the successfully performing districts. Since districts that perform at high levels often enjoy a very substantial wealth base, and therefore can choose to spend at very high per pupil levels, concerns about spending levels well beyond what is strictly necessary are characteristic of this method.

A traditional response to this concern is to constrain the selection of districts to be analyzed. For example, the districts for which the average expenditure per pupil of successful school districts that would be established could be restricted to the lowest spending 50 percent of such adequately performing districts.

Three Critical Methodological Questions

¹ The shift from equity to adequacy in school finance is a shift that has been driven by an emerging consensus around high minimum outcomes as the orienting goal of both policy and finance. This has been well described by William H. Clune. *The Shift From Equity to Adequacy in School Finance*. June 1993. See also the Report on Funding Equity and Adequacy, The State Aid Work Group (July, 1999), SA (D) 1.1. and Attachment

As the methodology was developed, researchers answered three questions involving very specific operational definitions of major concepts. The questions were:

1. How should academic performance be measured?
2. How should pupil need be addressed? and,
3. Should there be a regional cost adjustment?

Measurement of Academic Performance

A critical methodological issue addressed by the study concerned the measurement of academic performance. New York State is presently utilizing a series of tests designed to measure academic performance at various grade levels. Examples of such examinations include:

- English Language Arts and Mathematics (fourth grade)
- English Language Arts and Mathematics (eighth grade)
- High School Regents examinations (e.g., English, mathematics Social Studies), students are likely to take in order to graduate.

Use of Fourth Grade Tests. Fourth grade test results can be grouped into four categories or performance levels. These performance categories are:

- Level 1---Does not meet the standards
- Level 2---Meets some of the standards but not all.
- Level 3---Meets all standards and
- Level 4---demonstrates proficiency.

High School Regents Examinations. Several important issues had to be addressed in using the results of high school examinations as components in the operational definition of an adequate education. First, results on Regents exams are given as a numerical score only. Scores are not automatically translated into levels of performance. However, it is clear that a score of 65 on a Regents exam meets the standard. Therefore, tests scores of 65 and above were treated as the equivalent of Level 3 or above.

Data on Regents High School examinations were collected for six tests. The tests were:

- Mathematics A;
- Global History;
- U.S. History;
- English;
- Living Environment and
- Earth Science.

A potential problem with using single-year test results, of course, is that academic outcomes in any one year may be atypical and more reflective of a one-time phenomena rather than representative of academic outcomes over a multi-year period. This traditional critique was addressed for this study by using a three-year average of test results. Test results used in the study were from the 2005-06, 2006-07 and 2007-08 school years.

Upon reaching this decision, the study still had to address three questions. The questions were:

1. What level of achievement should be reached?
2. What percent of students should attain the specified outcome? And,
3. What tests should be used?

If a district is providing the opportunity for an adequate education, it would seem that the vast majority of its students should be capable of achieving the Regents standards. This means, on whatever tests one uses for defining academic outcomes, the vast preponderance of students should be scoring at the equivalent of level 3 or level 4. So for this study, it was determined that if a district had on average 80 percent of its students scoring at level 3 or higher on the specified tests, the district would be providing an adequate education.

Finally, the study had to determine which specific examinations would be used in developing the cost estimate. It was decided:

- To use both fourth grade tests in the definition of an adequate education. This decision was made primarily because only the central high districts do not have a fourth grade. Only one district was lacking fourth grade data. Thus almost every district would have fourth grade data, which would be a strong indicator of whether students had or had not acquired a sufficiently strong educational foundation to insure that high school graduation requirements were likely to be met; and,

- To use the test results of the six high school examinations previously listed, since passing of these or similar tests is required for high school graduation.

Missing Data. An important issue from a methodological perspective was how to treat a district if it were missing data. Missing data could occur because of several factors. These factors include:

1. Grade configuration of a district. A K-6 district would not have eighth grade or high school results. Conversely, a central high school district would not have any fourth grade results. In a sense, the district wasn't missing data as much as the data were non-existent for the district. Grade configuration was a major factor in missing data. For example, of the five districts without any data for either of the fourth grade tests, four were central high schools.
2. Data were truly missing. No test data exists for one district. Other data may be missing due to administrative error or a particular test was not given in a district for one or more years.

Based on these circumstances, the following decisions were made:

- If absolutely no test data existed for a district on any of the tests used, it would not be included in the study. Kiryas Joel was the only district not included in the study for this reason.
- If a district had some test data, the determination concerning provision of an adequate education would be based on existing data.

Operational Definition of an Adequate Education

Based on all of the considerations described above, an adequate education was operationally defined as a district:

With a simple, unweighted average of 80 percent of its test takers scoring at Level 3 or above on eight examinations (Fourth Grade English Language Arts, Fourth Grade Mathematics, high school Mathematics A, Global History, U.S. History, English, Living Environment and Earth Science) in 2005-06, 2006-07 and 2007-08. Note that, given this operational definition, a district could have less than 80 percent of its test takers with a score at Level 3 on one or more of the tests and still be providing an adequate education.

518 school districts met this standard, including: 6 High Need Urban/Suburban districts, 90 High Need Rural districts, 290 Average Need districts and 132 Low Need districts.

Student Need

If student need is believed to be an important issue in understanding academic performance two methodological questions concerning the quantification of need must be addressed. The questions are:

- What measure (pupil count) is available to best reflect student need?
- What is the appropriate additional weighting(s) to give students so as to quantify the additional educational services such students require if they are to succeed?

What Pupil Count Should be Used to Measure Need? An assortment of measures could be used to estimate student need. Each of the possible counts possesses strengths and weaknesses. A common measure used to identify student need among the 50 states is the percent of students eligible for a free and reduced price lunch. For these reasons, the study concluded student need could best be measured by the percent of K-6 pupils eligible for a free and reduced price lunch.

The count of K-6 students eligible for a free or reduced price lunch, however, is subject to wide variation in some districts. For this reason, average counts reflecting three school years were used. Such an average would minimize the possibility of grossly misidentifying a district's poverty rate due to a unique circumstance. K-12 districts that did not provide a school lunch program in 2005-06, 2006-07 and 2007-08 were given a K-6 free and reduced percent of zero. Central high school districts were given the average count of their components.

What Should Be the Additional Weighting for Need? To incorporate "need" into a student count requires the development of an additional weighting. In school finance, the term additional weighting is usually associated with the quantification of the extra costs associated with providing a specified service. These extra costs are then translated into an additional weighting. The additional weighting selected is extremely critical in determining the cost of an adequate education.

Although a wide range exists in the research literature in terms of the appropriate additional weighting for student need, most of the literature suggests an additional weighting of at least 1.0. While other weightings and pupil counts were considered, both separately and in combination, the use of an additional 1.0 weighting for the free and reduced price lunch proportion of the student population was continued.

Cost Adjustment

For a number of years, the Board of Regents in its State Aid proposal has also endorsed the concept of adjusting State Aid to reflect the variation in regional cost found to exist in New York State. It has done so due to the dramatically different costs associated with educating students in various geographic regions of the State.

To properly reflect these differing educational costs, it was decided to incorporate regional cost into the cost estimates. The cost indices used in calculating the estimate are the Regional Cost Indices (RCI) calculated for the 2010-11 State Aid Proposal of the Board of Regents. The RCIs were calculated based upon labor force regions as these have been defined by the New York State Department of Labor. The RCIs calculated for these labor force regions have been normed to a "North Country standard" and are described in Table 1 below:

Table 1: Cost Indices for Labor Force Regions in New York State:

North Country	1.000
Mohawk Valley	1.036
Southern Tier	1.061
Western NY	1.103
Central NY	1.130
Finger Lakes	1.133
Capital District	1.149
Hudson Valley	1.392
Long Island/New York City	1.544

Expenditures Per Need-Adjusted Pupil

The final approach was to develop an "expenditure per need-adjusted pupil" model, which compared the expenditure pattern of districts with acceptable academic performance to districts with educational performance below the stated standard. Expenditures were defined as general education instructional expenditures² (including an estimated amount for fringe benefits) as adjusted by the Regents Regional Cost Index calculated in 2009. The pupil count used was the same count used for general education instruction as defined in statute for the Fiscal Supplement to the School Report Card.³ This count was then adjusted to reflect student need by weighting the K-6 free and reduced price lunch count at an additional 1.0.

² Instructional expenditures include teacher salaries, other instructional salaries, BOCES, tuition, equipment and other expenditures.

³ Average daily membership plus resident students attending other districts plus resident students attending charter schools plus incarcerated youth, as applicable.

A graph of this prototype is shown in Figure 1. Under this approach, the first step was to identify districts providing an adequate education. As noted earlier, such districts were defined as districts in which an average of 80 percent of the students taking the eight previously identified examinations had a score that was at Level 3 or above. Districts in which on average less than 80 percent of the students tested score at levels 3 or 4 were identified as districts which may need to increase instructional expenditures in order to improve academic performance.

The next step in the methodology was to calculate the mean need and cost adjusted instructional expenditure per pupil for all districts classified as providing an adequate education. These districts were then ranked from high to low on need and cost-adjusted instructional expenditures per pupil. The mean expenditure per pupil was calculated for the lower half of these districts.

The selection of the lower-spending 50 percent of performing districts is designed to serve as an “adequacy filter.” The filter is meant to distinguish between those districts offering an adequate education and those districts offering an enriched educational program. There is no intention to discourage districts from offering enriched programs. However, it is necessary, for the purpose of determining a foundation amount, to distinguish somehow between what is necessary and what goes beyond.

For each district with less than 80 percent of its students scoring at Level 3 or Level 4, a spending-per-pupil analysis was conducted. The need and cost-adjusted instructional expenditure per pupil of a district was compared to the mean expenditure per pupil of districts classified as providing an adequate education described above.

If a district had a need and cost-adjusted instructional expenditure per pupil that was greater than the per pupil expenditure of lower spending, performing districts, it was assumed that the district was spending sufficient funds to achieve the standard. No estimate of needed *additional* expenditure increases would be calculated. However, if a district had a need and cost-adjusted instructional expenditure per pupil that was less than the per-pupil expenditure of the lower spending, performing districts, the additional expenditures needed by a district would then be estimated. This difference in per-pupil expenditures was viewed as a “spending gap.” The calculation of the additional adequacy cost estimate required three steps. The steps for each of the districts with academic outcomes below the desired standard were the following:

1. First, the “spending-per-pupil gap”, (i.e., the difference required to achieve adequacy) was multiplied by the number of estimated need-weighted pupils in the district; and,

2. The above result was then multiplied by the Regional Cost Index so that the result could be expressed in actual, purchasing-equivalent dollar terms; and,
3. The actual purchasing-equivalent dollars needed by districts with academic outcomes below the desired level were then summed in order to calculate the statewide additional cost total.

Thus, the procedures followed by the study to estimate the amount of additional instructional expenditures required to achieve adequacy can be figuratively expressed as shown in Figure 1.

Figure 1: Estimating the Increase in Instructional Expenditures Needed So That the Opportunity for an adequate Education is Provided by All Districts

