Bureau of Legislative Research

Policy Analysis & Research Section

# An Overview of Methodologies of Assessing Educational Adequacy

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2014 Adequacy

## Background

A primary "driver" of educational finance has been litigation in courts throughout this country over the past four decades.

Historically, two primary legal frameworks or arguments, adequacy and equity, have served as the guiding principles for making decisions about resource distribution to school districts that vary in terms of student characteristics and concentrations of poverty.

Equity arguments are concerned with comparative measures of any inequities in resources needed to provide equal educational opportunities to all students, irrespective of individual disadvantages or community wealth.

In contrast, adequacy studies focus on sufficiency of resources in every school district to provide an adequate education to all students based on some educational standard.

## Equity & Adequacy

The written report contains a brief overview of evolution of legal arguments from the concept of "***equity***" to one of "***adequacy***" in this country.

The pivotal distinctions between equity and adequacy are revealed in their primary goal and measures. For example, equity (or equality) of resources can be achieved by "leveling down" the distribution of resources to every school district. Since equity is measured comparatively, it is possible to have equality in resource allocation without providing resources needed for an adequate education.

Similarly, it is possible to provide sufficient resources to all districts in order to offer an adequate education without attempting to equalize the educational opportunities for all students in a state.

In practice, while providing sufficient resources to offer an adequate education to all children has become the primary goal in resource allocation, equity remains in the background as states develop categorical funding for disadvantaged students, or calculate mathematical weights for additional funding for these students, to create equal educational opportunities.

## Purpose of the Report

Thus, Rebeca Whorton, an analyst with the Bureau of Legislative Research, will present equity analyses of Arkansas school districts in February, 2014.

The purpose of the current report is to present a discussion and brief critique of the four primary methodologies used to assess educational adequacy: 1) evidence-based model, 2) professional judgment, 3) successful schools approach, and 4) cost function (or statistical) analysis. It is not the aim of this presentation to advocate for one method over another, or to offer any recommendations for change in current study procedures.

Arkansas and Kentucky have relied on the *evidence-based* model to determine amount of resources needed to provide an adequate education.

In the *evidence-based* model, consultants are hired to design a package, or recipe, of resources (e.g., our Matrix handout) needed to provide an adequate education to all students. Based on their knowledge of research methodology and existing evidence, consultants make decisions about types and amounts of resources needed to achieve defined education standards.

## Evidence-based Model

Recommendations regarding the distribution of resources are based on consultants' interpretations of the effectiveness of various resources in facilitating student achievement.

Adequacy is assessed by comparing district resources to the resource allocation package (Matrix) recommended by the expert consultants. Costs (or expenditures) for each resource are based on estimates found in the school finance literature, and these costs are summed to arrive at a total cost (or per pupil cost) for funding adequacy.

A salient strength of the *evidence-based* model is the use of experts who have extensive experience in conducting and evaluating research on resource allocation and student performance. They typically are highly trained methodologists who have a thorough knowledge of the research on school finance and student achievement.

Furthermore, the evidence-based adequacy study process is transparent and easily understood, and it examines current data from the educational system being evaluated.

## Critique of Evidence-based Model

Critics point out that the *evidence-based* model focuses exclusively on inputs (resources) to the exclusion of outcomes (e.g., student achievement).

Many contemporary researchers and policy-makers argue that the ultimate goal of education is student achievement, and therefore, an adequate education should be assessed in terms of student performance.

The only linkage between resources and student achievement in the *evidence-based* approach to educational adequacy are the extrapolations consultants make from prior research in designing a resource allocation plan or Matrix. However, critics argue that studies cannot be generalized across states that differ in demographics, such as poverty and parent education.

They also criticize the piecemeal practice of providing evidence for each resource separately instead of investigating the impact of the total resource allocation package consultants recommend to states.

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## Critique of Evidence-based Model

Critics point out expert judgments are influenced in immeasurable ways by personal preferences and biases, and they cite examples of how consultants have "cherry picked" studies that support their resource allocation, while ignoring contrary evidence.

They also note that there is scarce research on the effectiveness of resources on student achievement, and in some cases there is no evidence to support recommended resources.

Finally, reviewers observe that reports written by expert consultants typically do not articulate the methodological criteria used to select studies that provide support for resources recommended, which raises questions about the validity of studies used.

There appear to be no published examinations of the validity (accuracy) or reliability (consistency between evaluators) of the evidence-based method.

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## Professional Judgment Model

The *professional judgment* method of examining educational adequacy relies on the opinions of a panel of local educators (e.g., superintendents, education professors) instead of hired expert consultants. Panels have been constituted by expert consultants, legislators, and governors.

This panel of educators meets over a period of time to construct a package of resources. Once the resource allocation plan has been determined, the same panel, or a different group of experts, estimates the costs of each resource component.

To address the issues of validity and reliability, some states have used more than one panel that work separately to derive independent resource distribution models and costs.

The panels eventually meet together to integrate the independently-derived resource allocation plans. At times, panels have been informed by surveys of teachers, principals, and superintendents concerning needed resources and costs.

## Critique of Professional Judgment Model

An important advantage of the professional judgment approach to assessing educational adequacy is the deliberation by local professionals who are currently involved in the system being assessed, and intimately familiar with differences in districts, their resource needs, and regional costs.

This intimate knowledge is a "dual-edged" sword because, in practice, panels of educators have tended to simply present a "wish list" of resources, rather than design an efficient distribution of resources that supports educational adequacy.

Professional judgment methods of assessing adequacy typically have resulted in costly resource allocation models.

Educator panels rely on personal judgments based on knowledge and experience rather than on a systematic, clearly articulated set of mathematical procedures, such as statistical analyses. The personal preferences and biases inherent in professional judgments are especially problematic in making adjustments in resource allocation for high concentrations of poverty and other disadvantages.

## Successful Schools Model

The fundamental premise of the *successful schools* approach is that it is possible to determine an adequate base cost level by examining the basic spending of successful school districts. The *successful schools* method begins by identifying a subset of the schools in a state that are effective at meeting educational goals concerning student performance.

After agreement is reached on what constitutes a successful school, schools meeting the criteria are identified, and current expenditures for resources of these schools are calculated.

The average expenditure of these schools, or some percentage thereof, is established as sufficient for providing an adequate education. Expenditure data identify how dollars are spent, and spending patterns are used to establish resource allocation plans to provide an adequate education.

To assess differences in resource allocation between successful and comparison schools, researchers use regression statistics to examine how well resource expenditures and student and district characteristics predict achievement.

## Critique of Successful Schools Model

The regression analyses provide estimates of the impact of resources on achievement, after considering the effects (or influences) of student and district characteristics. The results of the regression analyses are used to devise resource allocation plans.

The most salient strength of the *successful schools* model is the intuitively appealing process of using the resource allocation of "successful schools" as a model for other schools.

This apparent strength has also proved to be a limitation in practice because evidence indicates that successful schools have different resource needs and demographic characteristics than schools with high concentrations of poverty.

Early studies attempted to address this disparity by identifying successful and unsuccessful schools within different demographic categories (or groups), such as high, middle, and low income schools.

## Critique of Successful Schools Model

However, studies have found that there are too few successful schools with high concentrations of poverty. More recent studies have addressed demographic disparities by using sophisticated statistics that examine the relationship between resources and achievement, after adjusting for student and district demographic characteristics.

Despite sophisticated adjustments for demographics, resource allocation models in successful schools often are not useful for schools with high concentrations of poverty because of differences in resource needs.

For example, schools with high concentrations of poverty often are located in communities that experience problems recruiting and retaining teachers, especially in critical subject areas.

Furthermore, analyses of *successful schools* typically do not have data on factors that have been shown to make the difference between success and failure, such as quality teaching and leadership.

## Cost Function (Statistical) Model

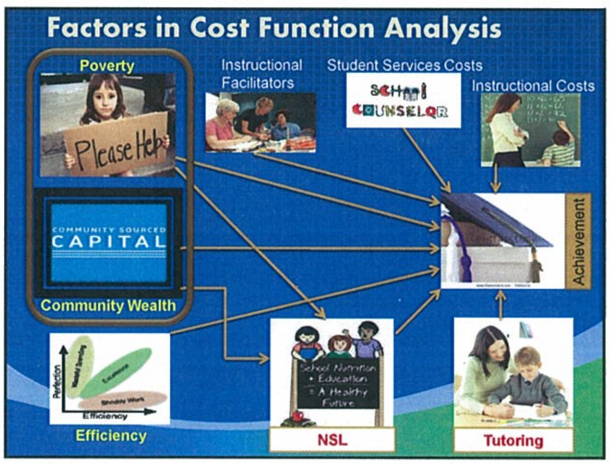
The cost function approach provides cost estimates of every resource needed by **each** district to reach a particular performance standard.

These estimates reply on clearly defined standards, accurate data, and systematic statistical adjustments for student and district characteristics that make the cost of achieving any given standard higher in some districts than in others.

A cost function statistical analysis systematically examines the relationships between resources (costs and staffing) and student achievement for **each** school district based on its **particular** student and district characteristics.

The statistical coefficients derived from regression statistics provide cost estimates for every resource for each district, and these estimates indicate the relative impact of each resource on student performance.

Finally, the statistical analysis indicates the amount of influence the resource package (or Matrix) has on student achievement.




## Critique of Cost Function Model

A particular strength of the cost function approach is the inclusion of an efficiency measure in estimating costs for each district.

The *cost function* approach to assessing educational adequacy has two major vulnerabilities that can limit its usefulness.

Sophisticated mathematical procedures used in the *cost function* analyses require valid (accurate) and reliable (consistent) data. These statistical procedures compound any errors in data, which results in distorted findings.

The *cost function* approach typically relies exclusively on available administrative data, including salaries, types of staffing, and expenditures for various educational functions.

However, national research (meta-analyses) indicates that interaction factors, such as quality of teaching and leadership, play a more significant role in student achievement gains.

## Discussion & Conclusions

Each of the methodologies used for assessing educational adequacy offers advantages and weaknesses in comparison with the other methods.

An alternative to selecting one of these approaches for adequacy study is to use more than one and compare results. Several states have either used two approaches simultaneously, or alternated methods from one year to another.

Also, states have taken advantage of the differential strengths of the methods by using them for different purposes.

For example, expert consultants might be commissioned to design a national state-of-the-art resource allocation system (Matrix) that accounts for the diversity in student and district characteristics.

Their system of resources then could be used as a template to initiate a discussion of resource needs in a local educator panel (or panels). This panel's proposed resource allocation strategy could serve to inform a more systematic statistical analysis of resources, student and district characteristics, and student performance outcomes.

## Various Adequacy Methodologies

The documents below can be found at the following link:

http://www.arkleg.state.ar.us/education/K12/Pages/InitiativesAndReports.aspx?catId=23

- A 50 State Strategy to Achieve School Finance Adequacy, Odden and Picus, 2008
- Achieving Educational Adequacy Through School Finance Reform, 2000
- Equity vs. Adequacy in the State's Provision of Education, 2006
- Performance Standards and Educational Cost Indexes, 1998
- Responding to the Charge of Alchemy, 2006
- School Outcomes and School Costs, Texas A&M University
- Study of Educational Adequacy, How Much Money is Enough, 2010
- **The Alchemy of Costing Out an Adequate Education, Hanushek, 2005**
- **Pseudo-Science and a Sound Basic Education-Voodoo Statistics in New York, Hanushek, 2005**

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