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Improving "Adequacy" Concepts in Education Finance: A Heuristic Examination of the Professional Judgment Research Protocol

R. Craig Wood and R. Anthony Rolle

State legislatures, policy analysts, and researchers are attempting, in many instances, to measure levels of equity as well as the levels of adequacy provided by public elementary and secondary education funding mechanisms (Wood et al., 2007; Wood et al., 2005; Wood & Rolle, 2007). Moreover, education finance researchers generally agree that state education finance distribution formulas should be designed to address differences in educational needs by allocating different levels of financial resources among schools and districts (Mort, 1924). In fact, student weighted formulas date to at least the 1950s, with examples of weighted pupil calculations to adjust for grade level and school size provided in textbooks of the era (Mort & Reusser, 1951; Wood, 2007).

One goal of state education finance aid distributional formulas is to provide students, regardless of their individual backgrounds or their geographic circumstance, with comparable educational opportunities for achievement. Since the emergence of the 1990s accountability movement and subsequent passage of the federal No Child Left Behind Act of 2001, the emphasis of many state education policies has been on improving outcomes and not necessarily providing equitable financial opportunity to achieve them.

Student need driven state education finance formulas are rooted in the assumption that financial resources can be utilized to offset socioeconomic status differences among students. In addition, financial resources can be utilized to enhance equitable opportunities for learning and ultimately can create more equitable student opportunities in otherwise very different environments (Thompson, Wood, & Crampton, in press). As such, education finance distribution formulas tend to strive toward appropriate balances of student needs and societal resources.

State and private agencies have attempted to determine the costs of providing an "adequate" education for public elementary and secondary students. These attempts began in the early 1990s and

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continue to the present. Early attempts concentrated on what is generally termed the Professional Judgment Model. These early attempts utilized a single model that attempted to determine only one fiscal adequacy target. Generally, these types of models were, and continue to be, limited in design, application, and generalizability. Despite these severe limitations, many adequacy studies continue to rely on this methodology.

Over time, three additional models have emerged, i.e., Successful Schools, Statistical Analysis, and Evidenced-Based, each with strengths and weaknesses. As such, collectively, these four models tend to suggest a range of adequacy targets that should be the goal of an adequate expenditure range. Each model must be carefully designed and utilized in order for generalizable conclusions to emerge.

Without acknowledging such caveats, great caution must be exercised regarding typical education finance adequacy studies. Most of these studies are presented as scientifically-based investigations. However, in reality, any objective education finance research examination of these studies reveals evidence that they are opinion pieces guided and funded by private organizations that have specific political, social, and economic objectives regarding public elementary and secondary schools. While some of these goals may be notable and sincere, such studies are largely suspect and necessarily should be viewed carefully.

More importantly, all such adequacy studies are limited if they do not attempt to utilize all four present models. In fact, only a handful of studies have attempted to utilize all four models in terms of offering state legislatures aspirational targets of expenditures (Wood et al., 2007). Yet, the vast majority of studies tend to utilize models selectively in providing for various socio-political agendas in support of increased educational expenditures without comment on the exclusion of the remaining methodologies that may or may not support such claims. Thus, the agenda of these individuals is to support high expenditure studies, attack state legislative expenditure studies, and to ignore commonly accepted methodologies for determining adequate levels of educational expenditures.

The Four Methodologies: Determining Levels of Adequate Spending on Education

In order to identify adequacy target expenditures, four education finance models currently are found within the education finance research literature.

- Professional Judgment Model;
- Statistical Analysis Models;
- Evidenced-Based Model;
- Successful Schools Model.

This article offers a specific research protocol for the Professional Judgment Model to strengthen its utilization while outlining the remaining three models.

Professional Judgment Model

In order for the Professional Judgment Model to have validity in conjunction with the other methodologies, it first must be based upon a statewide survey of every building principal. Most researchers generally omit this critical aspect and, to date, this procedure has been conducted in only two states. Thus, in order to enhance the validity of this model, the model should be a Collective Judgment Model of educators from throughout a given state rather than merely small panels as generally done. From these data, numerous focus group meetings with "expert educators" can then attempt to estimate

Table
Example of an Overall Professional Judgment Model Calculation

School Classification	Percentage Increase Recommended (%)	School Prototype Recommendation (\$)	Actual School Expenditure (\$)
Elementary School:			
Large	13.5	12,157	11,168
Medium	16.0	12,996	11,343
Small	21.8	12,840	11,343
Middle Schools:			
Large	1.8	11,706	11,523
Medium	7.9	12,375	11,559
Small	4.0	13,099	12,648
High School:			
Large	2.7	11,380	11,113
Medium	2.1	11,877	11,657
Small	17.9	13,931	12,007

Source: Wood et al. (2007, April).

the adequacy levels for various prototype schools. Depending upon the specifics of a given state, various prototype schools would be created; often these prototype schools reflect small, medium, and large elementary, middle, and high schools.

This process of bringing together expert educators (i.e. expert panels) to determine the required inputs for an adequate education is known as the Professional Judgment Model. This has been the most mostly widely used approach to determine adequacy and has been used by private agenda organizations in many states.¹ The greatest strength of the approach is that expert educators are assumed to be intimately familiar with the needs of schools providing valuable insight as to the required fiscal inputs for an adequate education. However, education finance researchers also observe that when expert educators attempt to determine the level of fiscal adequacy, it also becomes the major limitation of the method. Specifically, these researchers note that educators who will be receiving the services may be biased and overstate the requirements. Furthermore, education finance researchers argue that many adequacy studies generally have far too few participants resulting in invalid samples. Specifically, should 25 educators determine the educational policy for an entire state? Finally, education finance researchers argue different groups of educators may arrive at different results and question the replicability of the approach in general. Notwithstanding these major limitations, the agenda-based studies and organizations continue to ignore these realities and concentrate on limited methodologies with exorbitant expenditure goals.

As a means to overcome the limitation of the Professional Judgment Model's having only a small group of individuals determine results, the Collective Judgment Model is necessary. In at least two state adequacy studies in which each principal was provided a survey with their corresponding prototype school and asked to provide input on what they considered to be the required adequate fiscal inputs, these limitations were overcome.

The creation of prototype schools is an essential step when undertaking a professional judgment analysis. These hypothetical prototype schools should be based on state specific statistics. Generally, elementary, middle, and high schools are ranked based on enrollment and split into three categories i.e., small, medium, and large. Then the average enrollments within each subgroup are determined along with the percentages of special need students, resulting in nine prototype schools: small, medium, and large prototypes for elementary, middle and high schools. The procedures must be adapted and modified for states that have atypical organizational patterns and populations. For example, an adequacy study for the Montana Legislature contained different prototype patterns from that of the study for the Rhode Island Legislature (Wood et al., 2007).

Along with overcoming the limitation of a small sample size inherent in other professional judgment panels, various and different school expert panels as well as school district panels strengthen the validity of such studies (Wood, Robson, Farrier, Smith, & Silverthorne, 2005). Further validity would be gained by having school expert panels held prior to administration of the survey and one after. The first school expert panel consists of various education entities in a state and, where feasible, all school district superintendents/staff for the district panel. Logistically, due to the numbers of districts, the input panels could consist of several panels operating independently of each other. For the second expert panel, principals from all "high performing" schools could participate. The agenda-oriented and sponsored studies do not attempt to have panels selected in any such manner. Generally, agenda-sponsored studies select individuals from low achieving, high expenditure districts that have not had success as measured by statewide mandates who then, as a result, argue that more moneys are needed. In a bizarre twist reflecting some type of Orwellian logic, the proponents of agenda-based studies reflect that such inclusive procedures, as discussed herein, are not "not up to industry standards" or are of "poor quality." Apparently,

these observations are based upon the relatively lower increases necessary to achieve an adequate education as compared to the agenda-based studies that average 30% or higher expenditure increases.

While information from surveys from all building principals in the state results in valuable information on required inputs, the research protocol then averages the results of the expert panels and thus provides the most valid information. Specifically, allowing educators to discuss the requirements with other educators in a collaborative manner and with a moderator helps overcome any questions or difficulties individual principals may have experienced with the survey.

Results for the prototype schools would then be reported based on school types and sizes along with the required fiscal inputs identified by the professional judgment expert panels. Once these figures are derived, then additional increases would be judged as to additional assistance for students not meeting standards. Additional programs such as summer school, after-school programs, and early morning programs would then be addressed as separate issues. An example of an overall professional judgment calculation taken from a selected state is shown in the table.

Statistical Analysis Models

Statistical Analysis Models create regression equations utilizing multiple variables to create a curve of best fit (Wood et al., 2007). Increasingly common among recent analyses of educational adequacy are statistical methods that may be used either to estimate: (a) the quantities and qualities of educational resources associated with higher or improved educational outcomes; or (b) the costs associated with achieving a specific set of outcomes in different school districts serving different student populations. The first of these methods is known as the education production function and the second of these methods is known as the education cost function. The two are highly interconnected and—similar to the Successful Schools Model—require state policymakers to establish explicit, measurable outcome goals.

In cost function analysis, the goal is to estimate the cost of achieving a desired set of educational outcomes and further to estimate how those costs differ in school districts with certain characteristics, serving students with certain characteristics. For example, achieving state average outcomes in a high poverty urban school district may have quite different costs than achieving the same outcomes in an affluent suburb. A cost function that has been estimated with existing data regarding school district spending levels and outcomes, and including data regarding district and student characteristics, can be utilized for predicting the average cost of achieving a desired level of outcomes in a school district of average characteristics serving a student population of average characteristics. Further, the cost function can be used to generate a cost index for each school district that indicates the relative cost of producing the desired outcomes in it.

Evidence-Based Model

The Evidenced-Based Model is built around the concept of identifying costs of multiple educational strategies that appear to be the most successful in maintaining and improving student performance. Examples of effective education strategies identified recently that have met strict evaluation procedure should be utilized. Unfortunately, the bulk of these strategies are virtually impossible to cost out and lack generalizability.

In the Evidence-Based Model, the protocol attempts to integrate a variety of "proven effective" input strategies such as class size

reduction, specific interventions for special student populations, and comprehensive school reform models rather than relying on a single reform model. Evidence-Based Models do not, however, reflect rigorous meta-analysis of all available studies on each possible intervention. Nor does application of evidence-based cost analysis require that the interventions in question be evaluated with respect to specific, policy relevant outcome measures. Thus, various studies purport to be evidenced-based yet use various standards for which studies are chosen.

Successful Schools Model

The Successful Schools Model is the process of examining the expenditures of schools that are deemed "successful" as measured by state assessments. Successful schools studies utilize student outcome data regarding measures such as attendance, dropout rates, and test scores to identify a set of schools or school districts in a state that meet chosen accountability standards for success. Then, to determine levels of expenditures, an average or some percentile of the expenditures of those schools or school districts is generally considered adequate. The assumption underlying the model is that some schools in the state are able to be successful with that chosen level of funding. Modified successful schools analyses include some consideration of how schools utilize the resources. In most cases, analysts may use data on how schools use the resources to identify and exclude peculiar, or outlier, schools or districts from the successful schools sample (Wood et al., 2007).

Discussion

As discussed earlier, the concept of the state education finance formula would be to offer every public school elementary and secondary student the availability of programs and services appropriate to his or her educational needs which are substantially equal to those available to any similar student notwithstanding geographic differences and varying local economic factors throughout a given state. The intent of this type of investigation is to determine the actual costs of providing an adequate education in a given state. The methodologies, as discussed and implemented, and the resultant targeted expenditures would drive the actual base student allocation for state policymakers. The state legislature would determine these expenditures in order to assure all school districts would have an adequate fiscal amount to provide instructional services.

Of the four models that can presently be utilized, the Professional Judgment Model and the Evidenced-Based Model present less valid and replicable models as compared to the Successful School Model and the Statistical Analysis Model. Specifically, the Professional Judgment Model is open to a host of criticisms and concerns, and reflects the lack of empirical rigor of either the Successful Schools or the Statistical Analysis Model.

If the Professional Judgment Model were to be utilized, and the authors believe that it has some merit, it must be done so while exercising the additional three models as discussed herein. Additionally, if the Professional Judgment Model were to be utilized, the usage of a statewide survey of building principals as described herein as the Collective Judgment Model, must be conducted in order to diminish the concerns of research validity and reliability.

Thus, for state legislatures given the present status and validity of education finance research, it is recommended that the Successful Schools Model and/or the Statistical Analysis Model approach

would be the most fruitful. If either of these two models were to be constructed carefully, a state legislature could produce a targeted expenditure that should be sound and reflect the present state of knowledge in funding public elementary and secondary education.

Of these two models, if one model were chosen, the Successful Schools Model, if carefully designed and crafted, would have the greatest probability of yielding the most useful model. This usefulness is reflected in that this model is the most closely understood by the public and thus reflective of public policy determinations. Again, it must be clearly understood that all the models provide useful information. It also must be clearly understood that certain models are more useful than others. Overall, a state legislature could choose any of the models and justify its actions. However, if the authors were to rank the four models for high to low in terms of their validity and usefulness, they would be listed as follows:

- Successful Schools Model (highest rank);
- Statistical Analysis Model;
- Evidenced-Based Model;
- Professional Judgment Model (lowest rank).

Notwithstanding this ranking, it is the purview of a state legislature to choose the model, combination of models, or ranges that it accepts as having the greatest validity. From the range of models and expenditure patterns, a strong, viable, and valid education finance distribution formula could be crafted.

It is important to note that this assessment has engaged in a heuristic examination of information as to how a state legislature can establish an amount to assure an adequate education for the school children in a given state. The conceptualization of the education finance distribution formula must be practically viewed as an overall child need based formula in order for state policymakers to address how the state legislature might wish to distribute state and local moneys for elementary and secondary education in the state. The actual design of a state aid distributional system is not part of this examination. This examination only addresses the targeted amount that should address the issues of offering an adequate education within a given state.

The state legislature may embrace any one of the methodologies as described herein or any combination of the methodologies. If a legislature were to embrace only one methodology to determine the adequate amount of funding public education, a legislature would be well advised to examine how successful schools, as defined by legislative enactments, could be utilized in meeting the targeted expenditures. If the Successful Schools Model were to take into account various achievement standards as well as those school districts making progress toward achievement levels and a host of other important and significant variables such as student demographics and differing educational needs that could be utilized within this model, it could generate the expenditure targets that could prove to be quite useful for a state legislature. With great care, the creation of a new and viable education finance distribution formula could be coupled to high performance school districts. The high performance school districts could be identified with legitimate adjustments. This model would be similar to the issues as identified in the Statistical Analysis Model and would reflect the aspirational fiscal goals that the state legislature should move toward over a reasonable period of time.

Reconciling the Various Approaches

In a perfect world, with perfect information regarding the relationship between resources and student outcomes, perfect data regarding student outcomes, and perfect measures of district inefficiency, resource cost and statistical cost function analysis would produce the same results (Wood et al., 2007).

To date, evidence regarding the effectiveness or the cost-effectiveness of Professional Judgment Model and Evidence-Based Model that commonly guide such analyses remains questionable at best (Hanushek, 2007; Levin, 2002; Borman & Hewes, 2002; Borman, Hewes, Overman, & Brown, 2003; Bifulco, Bordeaux, Duncombe, & Yinger, 2002). These reforms are most often introduced within the context of available resources rather than empirically estimated resource needs, and with existing teachers.

Thus, an overview of the four models for determining the fiscal level of educational adequacy leads to the overall conclusion that, if such an approach were adopted by a state legislature, the only valid methodologies would have to include all four models with a display of the strengths and weakness of each model. If the Professional Judgment studies were included, then the procedures as discussed herein would enhance its validity and reliability. The most notable weakness of virtually all Professional Judgment Models to date has been the lack of an attempt to measure the costs via statewide surveys of building principals and other professionals.

Endnote

¹ Private agenda organizations have conducted professional judgment studies in such states as Nebraska, Indiana, Colorado, Missouri, Kentucky, North Dakota, Montana, New York, and South Dakota.

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