CENTER FOR EVALUATION & EDUCATION POLICY

Education Policy Brief

What is the Complexity Index?

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VOLUME 5, NUMBER 2, WINTER 2007

CONTENTS

UPCOMING POLICY BRIEFS AND REPORTS . . .

- ✓ *Indiana's Mathematics and Science Performance: Do We Measure Up?*
- ✓ *Outcomes of the School Choice and Supplemental Services Provisions of NCLB*
- ✓ *The Use of Time During the School Day and Its Impact on Student Achievement*

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INTRODUCTION

For the past 30 years, education policymakers and researchers across the nation have been concerned with designing funding systems for public schools that distribute revenues in an equitable manner. One of the principles that emerged from this work is that school corporations with more traditionally disadvantaged students should be given more money to help narrow the achievement gap. This principle is known in school finance research circles as vertical equity. In response to calls for vertical equity, many states implemented funding formulas that allocated revenues to school corporations in part based on the socioeconomic status of the students served by the corporations.

Indiana is no exception. In 1993, the state created what was known as the At-Risk Index (ARI). The ARI was a weighted-average index comprised of three socioeconomic factors that were chosen because they were found to be correlated with measures of school corporation performance in the state. The state's funding formula was then modified to provide additional funding to school corporations in proportion to the ARI. Because higher values of the ARI were associated with lower socioeconomic status communities, the result was that these communities on average would receive more money per pupil than higher socioeconomic status communities. In 2003, the ARI was replaced by the Complexity Index (CI). The CI added two factors to the same three factors used in the ARI, and applied different weights to these factors.

There are reasons for concern, however, with the state's approach towards achieving vertical equity. Despite the efforts over the last 13 years to provide more funding to school corporations located in low-socioeconomic areas of the state, policymakers in Indiana have continued to observe substantial performance gaps between students in high- and low-socioeconomic communities. Students in wealthier communities continue to outperform their peers in poorer communities in terms of both pass rates on the ISTEP+ and likelihood of going on to college after graduation. Similar gaps persist by race/ethnicity and with all of the five Complexity Index factors.

As part of an ongoing and regular review of the school funding formula by a group of state agencies, questions have emerged as to whether the state is targeting the right socioeconomic factors for funding adjustments, and whether the list of factors in the CI should be expanded or contracted. The weights used for each factor in the CI have also come under scrutiny. While the original weights in the ARI were based on the strength of the relationships of each factor to school corporation performance, the weights have been modified over time as part of the legislative budgeting process, and may not reflect the current relationships. In addition, the weights may not properly take into account the interrelationships among the CI factors. Finally, the state's funding formula contains a number of overlay provisions that may be affecting the additional funding actually received by school corporations for each of the CI factors.

In this Education Policy Brief, we begin by describing in more detail how the CI was derived and how it is used in the state's funding formula. We then raise some issues that should be considered when policymakers consider changes in either the Complexity Index factors, the weights attached to each factor, or the manner in which the Complexity Index affects funding for school corporations.

DEVELOPMENT OF THE COMPLEXITY INDEX

Foundation aid programs, better known as funding formulas, are used in virtually every state to determine the level of educational resources for public school corporations. These aid programs were often created in response to legal challenges claiming that the levels of funding for school corporations were highly dependent on the wealth of the community.

In its simplest form, a funding formula prescribes the total revenue needed by each school corporation for providing basic education services and the shares of revenues that must be raised locally through a uniform property tax rate. The state is then responsible for making up the difference for school corporations between their "target revenue" and local tax revenues. In practice, states often make adjustments in the aid programs for the cost of living in the school corporation's community and the additional needs of particular groups of students.

Over time, policymakers across the nation recognized that school funding formulas could also be used as a means to help address the achievement gaps between selected groups of students. This corresponds to the notion that a fair system of school funding would have to provide additional revenues to school corporations with more traditionally disadvantaged students so that achievement gaps could be reduced or eliminated. This difference in revenue is referred to as vertical equity. Park (2004) found in her survey of the states that approximately half of all states provide for revenue adjustments based on measures of student poverty or at-risk students, and 19 states also do so for non-English speaking students.

Indiana has used a foundation aid program to provide revenues to public school corporations dating back to 1949 (Johnson & Lehnen, 1993). The formulas have changed substantially over time, as documented by Johnson and Lehnen (1993), Toutkoushian and Michael (2004), and Hirth and Eiler (2005). Indiana's formula begins with the level of total revenues for school corporations ("target revenue") and the shares of revenues that must be raised locally through property taxes ("tuition support levy"). Tax revenues from commercial vehicles, motor vehicles, and financial institutions are also included. The state is then responsible for making up the difference for school corporations between their target revenue and local tax revenues. This is depicted below in Figure 1.

In 1993, Indiana made changes to its funding formula to address vertical equity concerns. The state created what became known as the At-Risk Index (ARI), and used the ARI to ensure that school corporations in low-socioeconomic communities received more funding per pupil than their counterparts. The development of the ARI can be traced back to 1987 and Indiana Public Law 390, where the state established the Educational Opportunity Program for At-Risk Students. As noted by Gridley and Peters (1987, p.2), "Section 4 for this chapter requires the Department of Education to devise a formula to allocate $20 million to Indiana school corporations to fund eligible programs for students so defined." The law also specified that three factors were to be considered for use in the formula:

- The percentage of adults in the corporation with less than a high school education (*NoHS*);
- The percentage of single parent families in the corporation (*OneP*);
- The percentage of families in the corporation with dependent children and living in poverty (*Pov*).

None of the three factors were to have a weight greater than 50% in the formula for distributing funds.

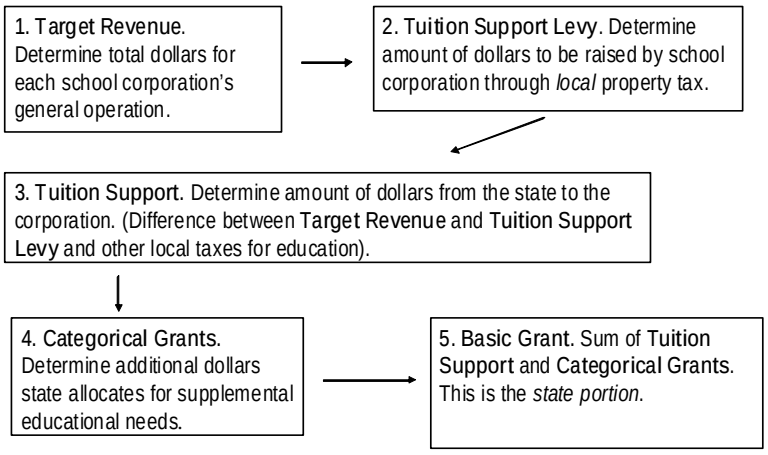
The weights for the three factors were based on the estimated strengths of the relationships between each factor and three measures of "academic failure": the absentee rate, the dropout rate, and the percentage of students who failed the Indiana Basic Competency Skills Test, a component of the Indiana Statewide Testing for Educational Progress (ISTEP) program. The Gridley and Peters (1987) study found that these three factors together accounted for 77% of the total variance in academic failure across school corporations, with the largest share (62%) being attributed to single-parent families (*OneP*), 24% for the percentage of families in poverty (*Pov*), and 14% for the proportion of adults without a high school education (*NoHS*). Due to the 50% restriction set by state law for any single factor, the final weights for each factor were 0.50 for *OneP*, 0.315 for *Pov*, and 0.185 for *NoHS*. The weights were then used to compute the ARI as follows:

$$ARI = 0.50*OneP + 0.315*Pov + 0.185*NoHS$$

The ARI could in theory vary between 0 and 1 depending on the values of the factors *OneP*, *Pov*, and *NoHS*. At one extreme, when all three variables equal zero, the ARI will equal zero. This corresponds to the highest possible socioeconomic status measure for communities. At the other extreme, when all three variables equal 1, the ARI will also equal 1. In practice, the average ARI value for Indiana school corporations in 1996 was only 0.198, with a minimum of 0.059 and a maximum of 0.433.

School corporations were then given supplemental funding in the form of a categorical grant to meet the needs of students in these categories. Because school corporations in low-socioeconomic areas had higher ARI values than other corporations, they received larger per-pupil supplemental funding from this source. The average per-pupil dollar adjustment in 1996 was only $19.80, and

Figure 1: Steps in Calculating School Corporation Funding in Indiana



ranged from a low of $5.90 per pupil to a high of $43.30 per pupil. These dollar adjustments represented a relatively small share of the per-pupil foundation level.

There were three drawbacks to the ARI that contributed to its eventual replacement. First, because the values for the three vertical equity factors were obtained from the U.S. Census, they could only be updated every 10 years. Accordingly, school corporations with changing demographics would not see changes in revenues keeping pace. A second concern was the observation of policymakers that students with limited proficiency in English may also be at a disadvantage in terms of their education, and that additional funding is needed for this group. Third, the dollar increases for at-risk students were relatively modest, and thus may have been less effective at narrowing the achievement gaps between groups of students. Finally, the ARI measures related only to the characteristics of the entire community in which a school corporation was located, and not necessarily the characteristics of the students that they served.

In 2003, in response to these concerns, the state of Indiana replaced the At-Risk Index with the Complexity Index (CI). The CI relied on the same three vertical equity factors as the ARI, plus two additional factors: (1) the percentage of students on free lunch (*FreeL*), and (2) the percentage of students with limited proficiency in English (*LEP*). The Complexity Index in any year is computed as follows:

$$CI = 1 + \beta_1 * NoHS + \beta_2 * OneP + \beta_3 * Pov + \beta_4 * FreeL + \beta_5 * LEP$$

with β_1* through β_5* representing the weights assigned by the state to each vertical equity factor.[1] The lowest possible value for the CI is 1.00 when all of the five CI factors are equal to zero. This corresponds to the highest possible socioeconomic status for a community. Figure 2 provides an example of how the Complexity Index was determined for Indianapolis Public Schools in 2006. As the socioeconomic status of a community decreases, the values of one or more of the five factors will increase and so will the CI.

The weights for all factors represent the proportion increase in funding that is to be given to school corporations for students in each category. The values are revised and updated each biennium by the state legislature as part of the budget deliberation process. The weights are set equal to the per-pupil dollar amounts prescribed by the legislature for each factor divided by the base per-pupil foundation level used in the funding formula. Figure 3 illustrates how the weights for each factor were set for 2006.

HOW TO SELECT COMPLEXITY INDEX COMPONENTS

The choice of factors to include in the Complexity Index has obvious implications for the amount of funding provided to school corporations and the state's ability to narrow the achievement gap. The first criterion is that the factors should have a theoretical connection between the socioeconomic status of students and/or their need for educational services. A second criterion is that the factors have to be measurable. States often rely on factors such as the educational attainment level and poverty status of communities — because the data are available from the U.S. Census. Similarly, school corporations routinely track the number of children who participate in the free lunch program. Other factors such as parental support and encouragement, which are likely to be related to student need, are difficult to measure and thus rarely included in state funding formulas (Christian, Morrison, & Bryant, 1998; Epstein, 2001; Henderson & Mapp, 2002).

A third criterion is that the factor should be correlated with student outcomes. This can be assessed by identifying particular outcome measures such as the ISTEP+ pass rate and determining if the factor in question is correlated with the outcome measure. Furthermore, the correlation should exist after taking into account the effects of other factors used in the index. If two variables are very highly correlated with each other (such as the percentage of children who receive free lunch and the percentage of families with children who are below the poverty level), then only one of the factors may be needed to capture the effect of the underlying concept (in this case, family income) on student outcomes.

CEEP is currently working on a study to examine the set of factors that could be included in the Complexity Index. In this study, we are focusing on the correlations between the five Complexity Index factors and the ISTEP+ pass rates for school corporations, and have found that (1) the variable for free lunch accounts for more variance in ISTEP+ pass rates than any other factor, and (2) the variables for limited English proficiency and poverty could be omitted from the Complexity Index with no substantial loss in the explanatory power of the model. However, because the state budget includes only $700,000/year for *LEP* programs, removal of this variable from the CI may be politically unappealing.

(Continued on Page 7)

Figure 2: Example of Complexity Index Calculation for Indianapolis Public Schools, 2006

- % population 25 or older with less than 12th grade education in 2000 = 28.32%
- % single-parent families in 2000 = 55.49%
- % families with children < 18 and incomes below poverty level in 2000 = 24.32%
- % students receiving free lunch in 2004-05 = 65.53%
- % students with limited English proficiency in 2004-05 = 7.24%

Complexity Index = 1 + (.2832)(.2256) + (.5549)(.1233) + (.2432)(.0768)+(.6553)(.2789) + (.0724)(.1001)
= 1.341
+ additional adjustment of 0.50*(1.341-1.25) = .0455
= 1.3865

Figure 3: Calculation of Weights in Indiana's Complexity Index for 2006

CI Component	*Weight*
% population 25+ with less than 12th grade education (*NoHS*)	$1,019/$4,517 = 0.2256
% single-parent families (*OneP*)	$557/$4,517 = 0.1233
% families with children < 18 and incomes below poverty level (*Pov*)	$347/$4,517 = 0.0768
% students eligible for free lunch (*FreeL*)	$1,260/$4,517 = 0.2747
% students with limited English proficiency (*LEP*)	$452/$4,517 = 0.1001

Policy Perspectives

SCHOOL FUNDING 2007: MORE PROGRESS OR MOVING BACKWARD?

Senator Luke Kenley

Two years ago, in the budget bill enacted in 2005, Indiana took a giant step forward in adopting a new approach to school funding, one designed to drive funds equitably to all public school children of our state, taking into account the needs of each and every child. The catch phrase used to describe the formula is "funding follows the child". It removes political maneuvering as a determinant and focuses on need by driving additional funding to those children that display at-risk characteristics statistically proven to be closely associated with poor classroom performance.

Stated simply, the formula provides a foundation amount that the school receives for every child, then uses a "Complexity Index" to drive additional funding to children who exhibit one or more of the following at-risk characteristics:

1. Free lunch eligibility
2. Single parent family
3. Family below federal poverty level
4. A parent with less than high school education
5. Limited English language proficiency

Amounts are designated for each at-risk characteristic and are included in the funding for that child. In addition, if a school corporation in total shows a complexity factor above a certain level, additional funds are included to compensate for the aggregating effect of the factors.

Beyond these calculations, additional funding is granted on a per-child basis for three levels of special education qualifiers, for certain desired vocational education programs, and for "primetime" support.

All of these factors were implemented in a transitional approach from the old formula so that no corporation would be impacted too much by a sudden shift in formula application.

In addition, a number of categorical grants managed by the DOE, such as textbook reimbursement, summer school, remediation, gifted and talented, etc., were added for targeted support of certain schools.

A critical issue for the 2007 session will be whether this new formula, more objective and less political, will prevail, or whether the Indiana Legislature will return to a more bare-knuckled approach, which pits different types of school districts against each other in a fight for education dollars. My hope is that the future of each and every child will keep our focus on how best to produce effective funding for public education.

Other topics that will be on the table include: how much overall increase in funding can be supported, full-day kindergarten implementation, possible solutions regarding the shockingly high dropout rate, whether we can reduce reliance on property taxes for the relief of property tax payers, and how to attract teachers to certain curriculum areas and to schools with greater challenges.

An additional pressure point regarding school funding is the filing this year of a lawsuit, primarily funded by the Indiana State Teachers Association (ISTA), challenging the "adequacy" of school funding in Indiana. The complaint actually approves of many elements of the current funding formula, but feels that the overall funding levels are not "adequate", with the complaint defining how "adequate" should be measured.

With an average of over $10,000 per pupil being funded from all sources, Indiana has made strong efforts to produce needed funds. By most comparative measures, Indiana's state legislature has clearly given public education a high priority in its funding decisions. It will be a matter of grave concern if school funding is taken out of the hands of the duly elected representatives of every voter in the state, and taken over by a single judge.

School funding is a complicated issue and requires much work on the part of many interested constituencies. It is important that all voices be heard. It is also important that we all support the result of our combined efforts, which of necessity will require compromise and understanding. Continuing to insure delivery of equitable and adequate funding for education to help our children prepare for their future is worthy of our best effort.

Luke Kenley is the state Senator for Senate District 20 in Indiana

Policy Perspectives

SCHOOL FUNDING: A COMPLEX ISSUE

Dennis L. Costerison

Several years ago, the joke in the State House was that the four people in the State of Indiana who understood the school distribution formula couldn't ride in the same airplane. In other words, the complexity of the formula was so great that only a handful of individuals could explain it. The funding mechanism for Indiana's public schools for 2007 continues to be complicated and covered by various policy decisions.

It now takes 23 pages to determine the amount of state and local dollars that will be distributed to public schools in 2007. Why so complicated? School funding has evolved into a process that contains numerous factors to meet the needs of an ever-changing school environment. The community demographics have changed and student population continues to diversify.

When I began my career with the Department of Education in 1971, the formula was on one page. Of course, the world was not as complicated then, and we did not have a Complexity Index, separate special education and vocational education funding, prime time, property tax shortfalls, adjusted enrollment figures, target revenues, charter school funding, English as a second language students, enrollment growth factors, and so forth. In 1971, there really was not a formula as we know it now but a flat grant that the state provided to schools. At that time, local school boards could determine the amount of property taxes they needed for their general operations. That local control ended with the 1973 Bowen tax package. The General Assembly now controls both state and local funding levels. The concept of the current foundation formula began in 1974 when the foundation amount was $445. The foundation amount in the 2007 formula is $4,563, and it takes those 23 pages to determine the distribution.

In the 2007 session of the General Assembly, a new school formula will be developed. The 2007 formula will generate over $3.7 billion of state support and over $2 billion of local property taxes for the General Fund of Indiana's school corporations. Sixty percent of the local share is paid by the state through property tax replacements credits. So, the true local share is less than 15% of the total formula funding. The largest portion of the state's biennial budget is for K-12 education, and school funding is a legislative priority that members of the General Assembly take extremely seriously.

For the past four years, the State of Indiana has been fighting its way out of the latest recession. State revenues from income, sales, and corporate taxes were far below estimates. The state surplus was gone, and legislators were hard pressed to find new money for any program. Overall school funding did increase during this time, but innovative funding sources (called outside provisions) were instituted to provide additional opportunities for dealing with General Fund expenditures. One such factor was the ability to pay for utilities and property/casualty insurance from the Capital Projects Fund. Even with the statewide increase in funding, formula amounts did not increase for some school corporations. This is the first time this has happened during my career. Over one hundred school districts received less money from the formula in 2007 than from their funding in 2006. Even with the outside provisions, 47 corporations received less funding. This happened because of a lack of state dollars, and not because legislators desired this outcome. But, for sure, the last four years have been difficult for the public schools.

Therefore, the 2007 session of the General Assembly is very important to Indiana's school corporations. For the next biennium, the budget forecast is somewhat brighter and there will be additional state funds available to provide formula increases. Governor Daniels has called for a minimum increase of 3% for each year of the next biennium and State Superintendent Reed's budget request was 4%, which is the Indiana Association of School Business Officials (ASBO) proposed formula increase. From all indications, each of the four legislative caucuses has made formula funding a priority.

Regarding specific formula issues in the funding mechanism, the complexity index is an important factor. This Education Policy Brief describes the history of the factor from the early 1990's as the At-Risk Index to its current composition. In order to meet the needs of children qualifying for the factor, the dollar amounts for each factor in the index should be increased. That is the greatest issue with the complexity index, and adequate increases would allow the factor to truly assist those students in need. There will be moves to add reduced lunch students to the free lunch factor and there could be a review of a rural factor this session. During the 2007 General Assembly, the Complexity Index will be one of the major focal points in determining the new funding formula.

The concept of guaranteeing a percentage increase over the previous year's revenue began in 1986. I can remember when the guarantee was 5%, and in the 80's there was also a 10% cap because the formula generated increases over 10%. Times have definitely changed. The 2007 formula does not have a percentage increase guarantee, but a guarantee of 99% of the previous year's revenue. From a theoretical standpoint, the guarantee concept does not allow a formula to work properly. From a practical standpoint, some form of guarantee could be needed if the formula does not provide adequate funding for some school districts. This concept will once again be a major policy discussion item. One way to make sure that the guarantee goes away is to have sufficient funding that allows the formula to work for all school corporations.

Another concept that will be reviewed closely this year will be the total elimination of property taxes in the funding formula. The State of Indiana has controlled the amount of state and local support for school corporations since 1974. Will local control be eroded if property taxes are eliminated in the formula? What happens to new school facility appeals and referendums? Where does new money come from for schools in times of recession? With this idea, the issues of tax appeals and not receiving 100% of property tax collections would be eliminated. This is an intriguing issue, and I look forward to an open debate on the concept.

Yes, school funding is complex. As school corporations evolve, the funding mechanism will follow. Hopefully, the current 23-page document can be reduced and simplified. I believe that is a worthy goal for the General Assembly and the school community. But, just in case, let's make sure those four folks who understand the formula travel separately.

Dennis Costerison is Executive Director of the Indiana Association of School Business Officials

Policy Perspectives

CONSIDERATIONS FOR THE NEXT SCHOOL FUNDING FORMULA

Terry Goodin and Erik Gonzalez

The task for public leaders and educators today is very daunting. The role of the educator and those leaders who supply the safety net for educators has expanded greatly beyond the scope of simply "educating" children.

Many educators today are all too familiar in dealing with social problems in the classroom that were previously dealt with by the family, community, and/or church. In many instances the teacher must assume the roles of family and community for those children who lack such support. Likewise, for many years educational leaders have tried to break down the social demographics of school corporations into the classic "urban," "suburban," and "rural." Today, however, state and educational leaders must look at a picture much broader than the generic "caste system" of the past. Local educators are realizing that those social factors once dealt with by urban schools are now also present in suburban and rural areas. Hence, to fulfill the educational need of all students, Indiana must reform the way it funds its 293 public school corporations. The Indiana General Assembly must allow educators to fill in the gaps left by a myriad of social and economic factors when educating students by properly funding the educational process in Indiana.

For nearly 15 years the underlying premise guiding Indiana's school funding formula has been one that has stressed the generalized concept of "equal" funding amongst school corporations predicated on pupil counts. The equalization in funding methodology has been the preeminent precept in providing state funding to Indiana's 293 school corporations regardless of how those school corporations' students are situated demographically or academically. However, a major paradigm shift in the field of education finance has recently materialized. The current concept of equalized funding has largely been eclipsed by the new concept of adequacy in funding.

Adequacy in funding differs from the equalization approach in the sense that funding is proportionately directed to where the academic need actually is, in contrast to the equalization in funding approach where the primary focus in funding is the allocation of dollars based on basic student counts ratios (i.e., more students = more money). The most obvious downside of this equalization process was the fact that it funneled a large portion of the states resources into a handful of school corporations whose student populations were growing at a very fast pace.

The adequacy approach acknowledges the fact that not all students come to school equally prepared to engage in academic activities. Adequacy funding attempts to rectify the existing disparities in readiness to learn by redirecting funds in such a manner that each and every student can be academically successful. Under the adequacy paradigm, it is perfectly acceptable for a student in one corporation to receive more funding than a student in another corporation. Coming into play here is the common knowledge in the educational realm the fact that some students are simply tougher to educate than others, therefore, more resources are required to accomplish the educational task.

The current Indiana school funding formula has tangibly acknowledged the dissimilitude in each student's readiness to learn and has at least begun to embrace (at least in concept) the adequacy approach by the creation and utilization in the current and (the immediately preceding school funding formula) of the Complexity Index. The underlying problems with the Complexity Index as currently constructed are basically two-fold:

1. The individual indices utilized in the index are derived for the most part from the latest Decennial Census figures (in this case the 2000 Census). The age of the data is a major impediment when it comes to accurately gauging current need and readiness;
2. Common research has shown that the most accurate gauge of need (trumping all others that are currently utilized) is poverty. Thus, the most accurate and time-sensitive proxy that can be used in Indiana when it comes to funding the Complexity Index is the Free and Reduced Lunch count.

Another significant area of concern with the current Complexity Index is the fact that even though the Complexity Index ostensibly generates and directs funding to those students with the greatest needs, when the index is actually calculated the students never receive the funding (in effect it is cancelled) because the inner workings of the formula in the ultimate analysis nullify the intent of the Complexity Index.

Thus, if the intent of the Complexity Index is indeed the re-direction of adequate resources according to the individual needs of the student, then the state must reformulate the Complexity Index so that only the Free and Reduced Lunch factor is utilized in the direction of resources. In addition, the univariate Free and Reduced Lunch should be funded in such a manner that "real" money is devoted to the factor within the actual funding formula.

As Indiana continues into the 21st century, the adequate funding of public schools must emerge as the great equalizer to help public leaders help educators overcome the barriers of underfunded school programming. Furthermore, re-directing much needed funds to all school corporations must be a central focus of any state funding formula that realistically expects to provide the programming needed for exemplary student achievement and life-long learning.

Terry Goodin is the state Representative for House District 66 in Indiana. Erik Gonzalez is a Fiscal Analyst for the Ways & Means Staff, Indiana House of Representatives.

HOW SHOULD THE WEIGHTS BE SET?

Once the ideal set of factors for the Complexity Index has been chosen, what weights should be used for each? The ideal approach would be to base the weights on how much funding is needed to ensure that students in each at-risk category can achieve at a level acceptable to policymakers. This would require a definition of acceptable academic achievement for students, and information about the amount of resources needed to enable students to reach this level. Adequacy studies in education focus on this specific question, and a number of states — including Indiana — have faced lawsuits over the adequacy of educational funding. A number of approaches have been used to date to determine the cost of providing an adequate education, including the professional judgment approach, cost function approach, successful schools approach, and the best practices approach. Examples of studies that have looked at adequacy include Reschovsky and Imazeki (2000), Guthrie (2001), and Alexander (2004). However, the field has struggled to find a reliable approach for estimating the cost of providing an adequate education, and delineating how the cost varies for traditionally disadvantaged students.

A second approach for determining the weights would be to set each weight as a percentage increase in the base per-pupil funding, where the percentage increases are determined by the relative magnitudes of the effects of each factor on academic performance. This was the general philosophy behind the original weights in the ARI in Indiana. For example, if the relationship between the percentage of students on free lunch and academic performance is twice as large as the relationship between *LEP* status and academic performance, then the weight in the Complexity Index for *FreeL* should be twice as high as for *LEP*. This approach is appealing to policymakers because it does not require a definition of an adequate education or estimates of the cost of achieving an adequate education, and the approach can be implemented regardless of the level of financial resources in the state for education. While this approach may help reduce the achievement gaps between groups of students, there is no guarantee that the funding system will enable all students to achieve at an acceptable level because the weights do not reflect how much additional money is needed to equalize educational outcomes.

COMPLEXITY INDEX AND PER-PUPIL FUNDING

After determining the factors and weights for the Complexity Index, decisions have to be made about how to translate this into funding for school corporations. In the state's current funding formula, the foundation grant for each school corporation is set equal to the base per-pupil foundation level multiplied by the Complexity Index and the adjusted enrollment count for the corporation. The adjusted enrollment count is a weighted average of enrollments for the preceding five years, and is an overlay provision that helps protect school corporations with falling enrollments from experiencing large declines in revenues over a short period of time.

Another complicating factor in the state's funding formula is that prior to 2005, each school corporation's total revenue was determined by the maximum of the foundation grant, the minimum guarantee (which increased the previous year's funding by a set percentage), and the variable grant (which was the prior year's revenue per pupil times the current enrollment). This meant that changes in the Complexity Index for a school corporation may not produce changes in funding if the corporation was not funded under the foundation grant option. The minimum guarantee and variable grant options were added to the state's funding formula to help protect school corporations with declining enrollments from experiencing large declines in revenues. However, the inclusion of these two options can weaken the relationship between the Complexity Index factors and per-pupil funding

CEEP has examined the relationships between per-pupil funding in Indiana and the Complexity Index factors, and found that the actual distributions vary considerably from what would be prescribed by the weights in the CI. For example, we found that the revenue increases given for the factors *NoHS*, *FreeL*, and *LEP* were notably smaller than what were intended in the funding formula. In contrast, the state's funding formula provides more revenues per pupil than intended for the factors *Pov* and *OneP*. These differences are attributed to the use of overlay provisions in the funding formula, such as the multiple options for calculating total revenue, and the fact that the Complexity Index is used to calculate base funding for each school corporation.

FINDINGS AND RECOMMENDATIONS

Overall, Indiana has made significant efforts to meet the funding needs of at-risk students through changes in its funding formula. The Complexity Index is a noble attempt to direct more education dollars to school corporations with higher need, and has the potential to reduce the achievement gaps between groups of students. However, it is important to review continually the way in which the funding formula is working, and determine if modifications should be made based on new information.

CEEP's recent analyses of the funding formula and the Complexity Index have identified several concerns that should be of interest to policymakers in the state. The first is that the additional dollars allocated to school corporations for the five at-risk factors in the Complexity Index are quite different from what is prescribed by the weights for these factors. This is due to the use of multiple overlay provisions in the school funding formula, and the fact that adjustments for the factors in the Complexity Index are made prior to the imposition of the overlay provisions. The second finding of note is that CEEP has found that only three of the five Complexity Index factors have statistically significant relationships with student performance on the ISTEP+ exam after taking into account the effects of the other factors in the Index. In addition, most of the variance in student ISTEP+ pass rates explained by the Complexity Index can be attributed to only one of these five factors: the percentage of students receiving free lunch.

What changes might be considered to address these issues? The first would be to eliminate the various overlay provisions in the state's funding formula. Although the state made strides in 2005 to do this by eliminating the minimum guarantee option, other overlay provisions still exist in the formula. These include the continued use of two alternatives to the foundation grant (the variable grant and the transition to the foundation grant), the imposition of a floor on the variable grant option, and the use of weighted average enrollments in determining the foundation grant. It is unlikely that all of these overlay provisions would be eliminated in the near future due to the large impact that this would have on the revenues of selected corporations, and the political process by which changes in the formula are made.

The second consideration would be to adjust the school funding formula so that the Complexity Index is independent of the overlay provisions. Essentially, each of the components in the Complexity Index would receive separate categorical funding as is currently done for special education, vocational education, and Academic Honors. The overlay provisions would still affect the baseline funding given to school corporations, but would not affect the additional funding that they would receive for the at-risk factors. This would return the state to the procedure used with the At-Risk Index. The state could determine the amount of additional dollars directed to school corporations for each factor through the weights in the Index, and then assign categorical funding for each factor. CEEP is currently working on a study that would illustrate how this would work.

Finally, the state might consider reducing the set of factors used in the Complexity Index. The census factor for poverty could be eliminated from the Index with little or no impact on student performance, due to its high correlation with the percentage of students receiving free lunch. Likewise, the evidence suggests that there is no relationship between the percentage of non-English speaking students and the aggregate ISTEP+ pass rate in school corporations after taking into account the other factors in the model. However, the elimination of the *LEP* category would likely be politically unattractive given that the legislature allocates such a small amount ($700,000 statewide) for non-English speaking programs. An argument could also be made for only using one factor — *FreeL* — in the Complexity Index because of the substantial impact that this factor has on the ISTEP+ pass rate relative to the other four factors in the Index. Future work by CEEP may also uncover evidence that other factors, such as the racial/ethnic composition of school corporations, should be added to the Index.

END NOTE

[1] An additional upward adjustment is made to the Complexity Index when the resulting value for a school corporation exceeds 1.25. The adjustments generally range between 0.02 and 0.04, and only affected 8 of the 292 school corporations in Indiana. As a result, the weights shown here are slightly lower than what would be true if the additional adjustment could be taken into account. More details on this adjustment can be found in the *Digest of Public School Finance in Indiana 2005-07* (Indiana Department of Education, 2005).

ACKNOWLEDGEMENTS

The authors would like to acknowledge the representatives from the following agencies that comprise the School Finance Group that meets regularly to advise the Indiana Department of Education and guides the school finance analysis conducted by CEEP: the fiscal analysts for the Indiana Senate and House of Representatives, Office of Management and Budget, Legislative Services Agency, Department of Local Government Finance, and the Indiana Department of Education. The Center would also like to acknowledgement Neil Theobald and Barry Bull, our predecessors at the Indiana Education Policy Center, for their work on the Indiana school funding formula and the At-Risk Index.

REFERENCES

Alexander, N. (2004). Exploring the changing face of adequacy. *Peabody Journal of Education, 79*(3), 81-103.

Christian, K., Morrison, F.J., & Bryant, F.B. (1998). Predicting kindergarten academic skills: Interactions among child care, maternal education, and family literacy environments. *Early Childhood Research Quarterly, 13*(3), 501-521.

Epstein, J. (2001). *School, family, and community partnerships.* Boulder, CO: Westview Press.

Gridley, B., & Peters, R. (1987). *Report to Indiana Department of Education At-Risk Functional Group.* Unpublished manuscript (available from authors upon request).

Guthrie, J. (2001). *Constructing new finance models that balance equity, adequacy and efficiency with responsiveness.* ECS Issue Paper. Education Commission of the States. Retrieved December 5, 2006, from http://www.ecs.org/clearinghouse/28/19/2819.htm

Henderson, A.T., & Mapp, K.L. (2002). *A new wave of evidence: The impact of school, family, and community connections on student achievement.* Austin, TX: Southwest Educational Development Laboratory.

Hirth, M., & Eiler, E. (2005). Horizontal and vertical equity analysis of Indiana's 2001 reward-for-effort formula. *Journal of Education Finance, 30*, 382-398.

Indiana Department of Education. (2005). *Digest of Public School Finance in Indiana 2005-2007 Biennium.* Retrieved November 29, 2006, from http://www.doe.state.in.us/publications/financedigest.html

Johnson, C., & Lehnen, R. (1993). Reforming Indiana's school finance formula, 1973-1990: A case of unanticipated outcomes. *Journal of Education Finance, 18*(3): 264-280.

Park, J. (2004). More different than alike: State strategies for funding education. *The Journal of School Business Officials, 16*(2), 14-26.

Reschovsky, A., & Imazeki, J. (2000). *Achieving educational adequacy through school finance reform.* CPRE Research Report Series, University of Pennsylvania, Graduate School of Education. Retrieved December 6, 2006, from http://www.cpre.org/Publications/rr45.pdf

Toutkoushian, R., & Michael, R. (2004). *Indiana's Foundation Program: A conceptual introduction.* Bloomington, IN: Center for Evaluation & Education Policy (available from authors upon request).

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