GROWTH INDEX:
a powerful tool for school improvement

The GI formula can be used by any school to calibrate individual student growth within all proficiency levels year after year, and track classroom or schoolwide growth.

Fall is an exciting time for educators as a new school year begins. Systems and processes are being refined, and the Academic Performance Index and Adequate Yearly Progress test scores are being released. Educators wonder whether the changes made during the previous year had a positive effect on student achievement. Once scores are released, the scramble begins. Everyone, whether they went up or down, is in a quandary, analyzing the data and reflecting on the activities that contributed to increased growth – or lack thereof.

California's integrated accountability system is comprised of the state's API and the federal government's AYP. Both hold educators responsible, more than ever before, for improving and sustaining student achievement year after year. One of the burning topics nowadays, a matter that is trickling down from Obama's administration, is the use of student achievement and student growth data in teacher and principal evaluations. Several districts are even exploring the idea of incentive and merit pay based on teacher performance.

One of the stumbling blocks with these new ideas is the fact that education has been known as a data-rich and information-poor profession. Paralysis by analysis begins to set in. Everyone becomes inundated with myriad minor details, and more often than not, they tend not to see the forest for the trees. That forest, metaphorically speaking, can be compared to the connections between instructional practices, students' test scores, and the impact both have on school-wide API and AYP scores. These relationships are indeed complex.

What if principals and teachers had a simple formula that quantified students' growth from year to year? Perhaps such a formula – used in combination with other information, of course – could serve as a catalyst for improving the quality of teaching, learning, and the use of data in the de-

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cision-making process. This article outlines just such a formula, which we refer to as the Growth Index (GI). It is designed to measure student growth, and that growth should be considered as one of several dimensions that constitute principal and teacher effectiveness. Unlike API and AYP, the GI formula treats all proficiency levels as identical and rewards continued growth at the highest level. Before examining the formula in depth, though, let's take a closer look at our current system of accountability.

API and AYP

API is a growth model that measures students' movement across proficiency levels. Schoolwide API is determined by a summation of individual student scores from one year to the next. If students increase in proficiency levels, points are gained; if they decrease, points are lost. Movement from the lowest proficiency level earns a school more points than movement from a higher proficiency level. In this way, API represents the weighted average of all students being considered.

One major drawback of API is that many educators, when taking into account the weight factor, spend the majority of their resources on students scoring at the lower levels. When such efforts are directed at at-risk groups, we do get results, but students at the highest levels of proficiency may decline. Student achievement and growth tend to gravitate toward where we decide the focus should be.

AYP, on the other hand, only measures the percentage of students who score Proficient or Advanced on the California Content Standards tests. If, for example, a school has 1,000 students, 400 of whom score within these parameters, the school's AYP would be 40 percent. Of course, according to the guidelines outlined in the No Child Left Behind Act of 2001, schools must increase their percentage of students scoring above the Basic level. AYP, unlike the API model, does not recognize growth within the lower levels.

Though both of these models have inherent flaws, together they create a much-needed synergy. If one accountability model were in use without the other, some students would certainly be left behind (and hopefully Congress takes this into account when reauthorizing NCLB).

To help principals and teachers determine their success in moving students to higher proficiency levels, we suggest using the GI formula, which efficiently calibrates student growth within all proficiency levels.

Capturing growth over subsequent years

Not only has the GI formula (pictured below) served as a practical tool for objectively exploring classroom and schoolwide growth, but it also has gained support because of its correlation with classroom and school-wide test scores. Generally speaking, the formula captures student growth over subsequent school years.

$$\text{Growth Index (GI)} = \frac{\frac{1}{2}(m) + i + a - d}{N}$$

Each school and district has access to a variety of reports that document student data for multiple years. One report that is particularly effective because of its visual straightforwardness is the pivot table. This instrument is excellent for comparing student growth between successive school years. However, regardless of how the data is captured across multiple years, the questions still remain: Did growth occur from the previous year? Was the amount of growth up to par? Could that growth be considered effective? GI lends a hand when attempting to answer these questions by placing a quantitative value on difficult-to-measure variables.

Understanding the formula

When calculating the GI for a particular group of students, one must include four variables:

1. How many students maintained the same level?
2. How many increased one or more levels?
3. How many Advanced students remained Advanced?
4. How many decreased one or more levels?

The variable *m* represents the number of students who maintained a level, which, according to the formula, earns only a half point. The variable *i* represents the number of students who increased one or more levels; one point is earned for each level of growth. The variable *a* represents the number of students who remained at the Advanced level; one point is earned for each of these students. The variable *d* represents the number of students who decreased one or more levels; one point is subtracted for each level they drop. *N* indicates the total number of students considered. Whether students progress or decline, points are allocated for each level gained or lost.

For example, when a student progresses from Below Basic to Proficient, which is an advancement of two levels, then two points

Interpreting student Growth Index scores

Growth Index Score	Probable Interpretation*
Less than 0.500	Students are typically maintaining and/or decreasing. Some students are increasing.
0.501 to 0.700	Students are typically maintaining. More students are increasing rather than decreasing.
0.701 to 1.000	Students are typically increasing and/or maintaining. Few students are decreasing.
Greater than 1.000	Students are typically increasing. Very few students are decreasing and/or maintaining.

**Note: These probable interpretations are general trends; however, other scenarios not considered here may also arise.*

are added. On the other hand, if a student declines four levels, falling from Advanced to Far Below Basic, four points would be subtracted. The equation is almost complete, except for one special case that must be considered in calculations of the GI. That case occurs when a student scores Far Below Basic one year and stays Far Below Basic the subsequent year. In this scenario, no points are assigned because no gains or decreases can be either observed or inferred.

These movements from lower proficiency levels to higher ones, or vice versa, involve the addition or subtraction of whole points. Those who maintained their levels, excluding the Advanced students, receive a half point. Once these points are determined, the final step is to divide that sum by the number of students being considered, variable *N*, resulting in the GI index. This final step normalizes the values, correcting the index for any differences in classroom size, thereby allowing for relative comparisons across classrooms with varying numbers of students.

The GI index, more often than not, is a decimal less than 1.000 and is always rounded to the nearest thousandth. As a rule, when an index value gets closer to 1.000, increased movement up proficiency levels can be observed, with fewer students decreasing or simply maintaining their levels. As the index approaches zero, more students are decreasing rather than increasing in proficiency levels.

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Scores above 1.000 are possible and considered remarkable. When this happens, several students are usually increasing more than one proficiency level. When GI scores hover around 0.500, they can be, for the most part, interpreted as overall maintenance. This score suggests either that all students remained at the same level or that an equal number of students lost and gained proficiency levels, thereby resulting in a net gain of zero. At any rate, neither maintenance scenario is desirable – the aim is growth. The above table summarizes probable interpretations of GI indices and how they relate to student growth data.

If you are considering using the GI formula and would like to see some examples, you may visit http://web.me.com/perrypwiseman/GrowthIndex. This website not only displays actual computations and descriptions, but it also illustrates their respective pivot table. The GI scores are offered for the first two examples, but we leave it up to you to calculate the GI of the third. If, after visiting the website, you would like to verify your answer, please feel free to contact the authors of this article.

Considerations for interpreting GI scores

In today's current climate – as district and school leaders make an effort to turn around under-performing schools – a tool such as the GI formula is imperative; it gives everyone a vehicle for impartially observing performance. Many have already used the process, compelling discovery of best practices and encouraging the group effort necessary to increase student achievement. And as a result of several intense debates, a couple critical issues have surfaced when contrasting and interpreting GI scores.

Specifically, it is always important to consider the student population observed, particularly when it comes to English learners and students with disabilities. Principals and teachers making progress with at-risk students, bringing them back up to grade level, may not see as much movement as their counterparts. However, because the tool is neutral, if principals and teachers do move students from Far Below Basic to Below Basic, the GI Index allots the same value to this increase as it would to growth at the higher levels.

By the same token, it would obviously not be suitable to compare a pre-algebra teacher's GI score to that of an algebra teacher. The difference in skill level in algebra compared to pre-algebra is too great. However, it is realistic to match up one algebra teacher with other algebra teachers at the same school, or different schools for that matter. These variables, along with many others, should be explored carefully when evaluating GI data. This type of conversation will provoke a deeper examination of student growth, an investigation that is certainly necessary for school improvement in the midst of all the accountability.

There are many advantages to quantitatively measuring such subjective notions as

student growth and effectiveness. One obvious advantage, since the index does not consider feelings and opinions, is that it provides an impartial numerical value by which relative evaluation can be determined. With the reauthorization of NCLB on the horizon, interest in a reliable growth model is mounting. The pendulum is swinging fast toward direct objective measures of student growth – accountability is really inching toward its acme.

An unbiased GI index summarizes a lot of valuable data, and it can be, in this age of accountability, a major vehicle for quantifying principal, teacher and student performance. Growth indices, whether the movement is predominantly up or down, also help tell us what steps must be taken to improve overall performance. There is no longer a need for clairvoyance or guessing games when digging deep into data and trying to measure growth; the GI formula does just that.

Taking data analysis to the next level

The process of calculating GI scores, and the related comprehensive discussions it encourages surrounding outcomes, has been presented to scores of school leaders across California. Over and over again educators have been energized by the possible benefits of using GI scores at their schools and within their districts, eagerly crunching the numbers to adjust instructional practices for the current school year. GI is truly taking dialogue about data analysis and best practices to the next level.

The power of GI scores is, without a doubt, limitless. They can certainly serve as a springboard when focusing on student growth; GI indices can lay a foundation for individual and group goal-setting and accountability. They can also serve as a medium for schools in building collaborative frameworks such as professional learning communities.

As educators, we know that change is on the horizon of accountability. Evaluation processes of principals and teachers are already undergoing a severe overhaul, as we stop doing what has not worked and implement more appropriate measures for analyzing and encouraging increased performance at schools. The GI index has the potential to be an extremely important, multi-faceted tool of the future, giving all involved the motivation to face the difficult challenges ahead. ■

For examples of how to use the GI formula, visit http://web.me.com/perrypwiseman/GrowthIndex. This website displays actual computations and descriptions and illustrates their respective pivot tables.

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