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## **Longitudinal Student Assessment: A Growth Model for Hawai'i's K-12 Students**

**HEPC POLICY BRIEF**  
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### **Statement of problem**

Can we use both proficiency standards and growth standards in assessing the progress of Hawai'i's K-12 students?

### **Content and importance of the problem**

In 2001, the federal government enacted No Child Left Behind (NCLB), resulting in unprecedented expansion of federal oversight of student achievement and requiring a number of changes in the state educational practices and assessment systems. NCLB's overarching goal is that all American students reach math and reading proficiency by 2014. NCLB requires states to develop content standards in core subject areas and provide school assessments of *adequate yearly progress* (AYP) that are linked to state-determined standards.

### **The problem with current AYP measurements**

Despite NCLB's focus on upgrading schools' educational outcomes, it offered no clear map regarding what content should be covered, how it should be measured, and what levels of progress should be required each year (Olson, 2005). Resulting state accountability systems vary considerably in design, implementation, and the comprehensiveness and rigor of their content standards. NCLB requires a simple, comprehensible measure for assessing whether schools meet public expectations e.g. a cut score indicating if a school and student subgroups within it surpass state-established proficiency targets. School progress is determined by whether successive groups of students can meet rising proficiency benchmarks over time. Unfortunately, although easy to understand, this type of simple measure, summarized as the "percent proficient," provides only limited information about what students learn during the school year or, more importantly, over the course of several years. When the assessment focus is on the percentage of different student cohorts that meet a required proficiency standard each year, it is easy for individual students' learning progress to become lost in the yearly aggregated student percentages. Moreover, the proficiency-status approach does not acknowledge the increased educational effort and resources needed to bring students who are behind their peers up to required proficiency levels, nor the marked improvement these students can make and still fall short of the proficiency levels for a particular grade level. In extreme cases, schools can be restructured with little guarantee that this action will indeed solve their achievement problems.

### **Growth models—an alternative worth considering**

In response to the controversy surrounding NCLB methods of monitoring school progress, a number of states have recently exerted political pressure on the U.S. Department of Education to pilot test longitudinal assessment as part of determining school AYP. Federal officials have been reluctant to allow states to develop growth modeling approaches for AYP purposes because of the erroneous perception that they are not designed to monitor whether or not students and schools meet proficiency benchmarks and, therefore, may lead to lowering academic standards for some groups of students (Olson, 2005). Rather than focusing on different cohorts of students each year, longitudinal assessment puts the attention more squarely on the same student cohort's experiences in attending a particular school over several years. Growth models enable the identification of individual student growth patterns that can take into account how earlier circumstances (e.g., previous skill levels, classrooms environments and teachers) affect students' current learning outcomes. Assessments of growth in student achievement over time provide a way of recognizing that schools serve students who start at different places and progress at different rates. Importantly, for school accountability purposes, growth models can be easily adapted to yield information about students' proficiency levels as well as their rates of growth each year. Despite their flexibility in providing expanded information about school progress, however, growth models represent uncharted territory for most states and school districts. For meeting AYP, growth models can identify (1) schools where students have made sufficient growth over time to surpass a required proficiency standard, even if they started with diverse prior learning levels; and (2) schools where a sufficient number of students have high growth rates that would lead toward their attainment of a proficiency standard at a future point in time.

### **A sample study**

This Policy Brief describes an analysis conducted with a sample of 5,000 elementary students in 123 K-6 elementary schools in Hawai'i to describe students' proficiency levels and individual growth patterns over time and, based on this information, to make judgments about school effectiveness in meeting performance standards. The goal was to illustrate how growth modeling can be used to monitor levels of proficiency, while also adding another, more equitable, way of looking at school progress -- one that is more directly related to what schools do in educating students, as opposed to what critics suggest currently merely reflects the demographic characteristics of school communities.

Student growth and proficiency level were monitored over a four-year period. Estimates of each were adjusted for measurement error and clustering effects of students within schools. Importantly, however, student growth rates and proficiency levels were not adjusted for various non-academic variables such as ethnicity and socioeconomic status (SES) that policy makers contend create separate standards for schools based on their contextual or student composition factors. After the estimates were obtained, proficiency and growth cut scores were derived for each school in order to determine which schools met standards set for sixth-grade proficiency and rate of growth. High-proficiency schools met a typical AYP standard for student proficiency (i.e., 62% of the school's students surpassing raw score standards set for three tests: reading, math and language). High-growth schools were those in the top 20% of the sample schools in terms of student academic growth between third and sixth grades for all three tests. These assessment procedures resulted in the identification of four groups of schools:

Group 1	Did not meet the standard set for the level of student proficiency and did not meet the standard set for student growth. (84 schools)
Group 2	Did not meet the standard set for the level of proficiency but met the standard set for growth. (10 schools)
Group 3	Met the standard set for the level of proficiency, but did not meet the standard set for growth. (14 schools)
Group 4	Met the standard set for the level of proficiency and met the standard set for growth. (15 schools)

Results of this analysis suggest that Group 2 schools would be overlooked if proficiency level were the only performance criterion used in evaluating progress. In fact, large numbers of students in these schools would meet proficiency standards set for future eighth-grade performance. Group 3 schools were high producing in AYP terms, but not exemplary for student growth. Group 4 schools met the proficiency standard in sixth grade, partly because students also made high levels of academic growth. Among the high-growth schools, 60% also met the required proficiency standard. This part of the analysis demonstrated that we can assess whether a school (1) met the absolute standard set for level of proficiency; and (2) whether it met the growth standard set for the amount of academic growth students made between third and sixth grades. Thus, the growth standard is useful in determining what “value” exemplary schools add to student learning, regardless of where students might have started academically in third grade.

The second part of the study focused on what school-related variables best explain the classification of schools into their proficiency-growth groups. Further analyses revealed two sets of possible explanatory variables: a *school contextual* dimension and a *school process* dimension. The *context* variables (e.g., community SES, student attendance patterns, teacher experience) primarily explained schools’ levels of proficiency. In contrast, the *process* indicators (e.g., leadership, academic expectations for students, school climate) primarily differentiated schools by whether or not they met the growth standard. Results of this analysis indicated that favorable *contextual* conditions dominate in identifying schools with high proficiency levels, i.e., Groups 3 and 4. High standing on academic *process indicators* contributes to the identification of schools having high student growth rates, i.e., Groups 2 and 4.

### **Conclusions**

Monitoring individual students’ academic growth provides expanded ways of thinking about school progress, an approach that may prove more equitable for purposes of comparing schools than the current proficiency attainment approach to AYP. This study shows that student growth is explained by *process indicators*, or factors schools are able to change to order to improve student learning over time, whereas the results explaining levels of student proficiency are primarily explained by *contextual inputs* that are outside schools’ control. A focus on growth can ensure all children are making academic progress over several years, based on their unique needs, as opposed to merely determining whether they have reached a standard at one point in time that might be easily attainable for some or unreasonable for others.

Growth standards are also useful in determining what educational value schools add to student learning progress, regardless of where students might start academically. Schools where students make considerably more growth than the standards set are settings that add academic value. This allows evaluators to emphasize educational inputs over which educators have relative control in judging school performance without making statistical adjustments for student background.

Using growth models to assess school performance is consistent with the view that schools serve students who begin at different places academically and progress at varying rates; that different resource levels and instructional techniques are necessary to foster all students' learning; and that the validity and equity of school comparisons are enhanced when the effects of factors outside of the school's control on achievement can be reduced. Growth models not only expand the information we obtain from assessments; they provide a more comprehensive framework for school assessment and a direct means for superintendents, principals, and teachers to identify student needs and engage in planned school efforts to strengthen instructional processes.

### **Policy recommendations**

The following policy recommendations are provided from the study:

1. Using growth modeling can be a way of rewarding high-growth schools for excellent performance. Even if students do not quite meet an absolute standard related to the level of the outcomes in these schools, they may have come a long way academically.
2. Growth modeling can be used along side of absolute standards for student proficiency levels. They add another way of looking at progress more directly related to what schools do over time to educate students, as opposed to primarily reflecting differences in community characteristics.
3. Teacher effects (e.g., quality) are an important source of student learning outcomes. Further work is needed in disentangling school and teacher effects from student background and contextual effects in fairly and accurately assessing school performance. Specifically, more research is needed to identify factors that actually comprise and contribute to teacher quality.
4. Growth models require significant refinement of states' assessment techniques. Among these are collecting data on individual students over several years and linking the data either to schools or to teachers within schools; creating state-wide data bases and standardizing assessment procedures; developing vertically-equated testing formats to align with longitudinal assessments; and increasing efforts to support value-added estimation of teacher and school effects on student learning.

### References

Olson, L. (2005, May 18). States hoping to 'grow' into AYP success. *Education Week*, 24(37), pp.15-20.